- - - Index to CONTENTS, September, 1935 - - -

Back numbers of The American City may be ordered from the publishers

Airports
Lighting, Radio and Heating for Floyd Bennett Airport, New York..... 51
Newark Airport Administration Building.. 52

Beaches
A Permeable Jetty Builds Up Kenosha's Beach Line 53

Bridges
Aluminum Paint, Pacific Coast Bridge.... 117

Cartoons
Riding Hog-Wild Again..... 89

City Manager Plan
Recent City Manager Appointments..... 93

Conventions and Expositions
Joint Sewage Works Meeting..... 15
Texas Centennial Exposition..... 58
Conventions—When and Where..... 111
Associated Municipal Signal Services..... 113

Finance and Taxation
Whence Comes the Money?..... 5
How Tax Limitation Laws Are Hurting West Virginia Municipalities..... 43
What the Depression Has Done to Cities.. 73
One City Takes Its Medicine..... 79
The Duluth School Board Changes the Bond Picture 83
The Municipal Bond Market..... 93

Fire Prevention and Control
McPherson, Kans., Fire Department..... 17

Forward Steps
Items Contributed by Officials and Others 81

Government and Administration
The Services of Municipal Departments Are Interdependent 11
Universities Aid Local Governments..... 56
What the Depression Has Done to Cities. 73
Business Machine Experience, Cleveland.. 85
How Long Do Officials Hold Jobs?..... 91

Health
Air Conditioning 7
Cities' Interest in Air Conditioning..... 85
Pocket-Size Kit for First Aid Treatment.. 117

Housing
General Electric Co. Aids Better Housing. 77

Improving Municipal Administration
Items from Public Administration Clearing House 91

Legal Decisions
The City's Legal Rights and Duties..... 107

Libraries
City Halls Need Reference Libraries..... 91

Liquor Control
Liquor Selling—Where—How..... 93

Motor Equipment
Tractor and Bulldozer Aid Sewer Line.... 15
McPherson, Kans., Fire Department Enlarged 17
Newark's Emergency Trucks..... 44
A New All-Wheel-Drive Unit..... 119
A New Two-Wheel Derrick..... 119
Garbage Collection Trucks, Cleveland.... 121

News and Illustrations
Hints for Officials..... 113

Outdoor Lighting
Lighting for Floyd Bennett Airport..... 51
Sodium Light 35 Times Moonlight for San Francisco-Oakland Bridge 123
New Lights at Saratoga Spa..... 125
240 Hp to Operate a Fountain..... 125
Illuminating Engineering Society President 125

Planning
Positive Planning Needed—Group Action Essential 46
New Courses in City Planning Announced 49
Purdue University Develops Community.. 69
Buhl Foundation Builds a Second Unit of Chatham Village 81
WPA Funds for Planning Studies..... 91
Zoning and Planning Notes..... 105

Playgrounds
New Ball Bearing for Swing Hangers..... 121

Police
Proofs That Police Radio Reduces Crime.. 17
Newark's Emergency Trucks..... 44
What Two-Way Radio Equipment Looks Like 115
A New Powerful Hand Firearm..... 121

Power Plants
Municipal Plants Given Preference by PWA 7
Wake Up, Municipal Plants!..... 7
Growth and Opportunity of Municipal Power 50
Better Exchange Between Los Angeles and Southern California Edison..... 65
1½-Mile Steam Main, Lansing Plants.... 85
Diesel Engines for Modern Power Plants.. 119

Public Works
Dallas Aids and Will Profit by the Texas Centennial Exposition 58
Recording Underground Structures..... 93

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EDGAR J. BUTTENHEIM, Pres. and Mgr.
HAROLD S. BUTTENHEIM, Editor
THEODORE R. KENDALL
Secretary and Engineering Editor
M. V. FULLER, Associate Editor
ALDEN W. WELCH, Research Editor
HERBERT K. SAXE
Treasurer
PRENTICE C. FORD, Asst. to President
MYRON MacLEOD, Advertising Manager

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TOM DIX, Vice-President
642 Hanna Building, Cleveland
GEORGE S. CONOVER, Vice-President
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Publications
New Books and Pamphlets..... 109

Public Works Administration
Municipal Power Plants Given Preference 7
September 12 Dead Line for Applications. 60

Purchasing, Municipal
Cities Awaken to Value of Quality..... 41

Radio
Proofs That Police Radio Reduces Crime. 17
Radio for Floyd Bennett Airport..... 51
Two-Way Radio Equipment..... 115

Schools
The Duluth School Board Changes the Bond Picture 83

Sewers and Sewage Disposal
Joint Sewage Works Meeting in October.. 15
Sewage Digester Gas for Power..... 15
Tractor and Bulldozer Aid Sewer Line Construction 15
Sludge Disposal at Schenectady..... 15
Activated Sludge Plant, Village of 1,300.. 54
Sewers Extended under CWA and FERA.. 57
A Power Sewer Cleaner..... 113

Street Cleaning
Municipal Housekeeping in Baltimore.... 67

Streets and Highways
Dust Laying 11
Brick Parking Strip Effective..... 11
Tests of New Fillers for Brick Pavement.. 11
Corner Curbs Improved, Streets Widened.. 57
White Concrete Traffic-Line Markers..... 59
Construction and Maintenance Methods for Traffic-bound Roads 63
Salt for Stabilized Roads..... 115

Swimming Pools
Buffalo's New Swimming Pools..... 83
Swimming Pool—Inland..... 85

Traffic
The Parking Meters..... 7
"Accident-Repeaters" Singled Out..... 87
Motor-Vehicle Education, Evanston..... 87
How It Goes..... 87
Seven Steps to Fewer Accidents..... 89
Riding Hog-Wild Again..... 89
New Type of Warning Signal..... 117

Unemployment Relief
Water-Works Construction; ERA..... 42
Oklahoma City; CWA, FERA..... 57
White Concrete Traffic-Line Markers..... 59
Recording Underground Structures..... 93

Universities
Courses in City Planning..... 49
Universities Aid Local Governments..... 56
Purdue University Develops Community... 69

Waste Collection and Disposal
Incinerator Ruled Out Near Homes..... 13
Waste Collection Division, Cincinnati..... 13
Fewer Garbage Complaints, Milwaukee... 13
Rubbish Collections, Akron, Ohio..... 13
A Community Responsibility..... 61
Garbage Collection Units, Cleveland..... 121

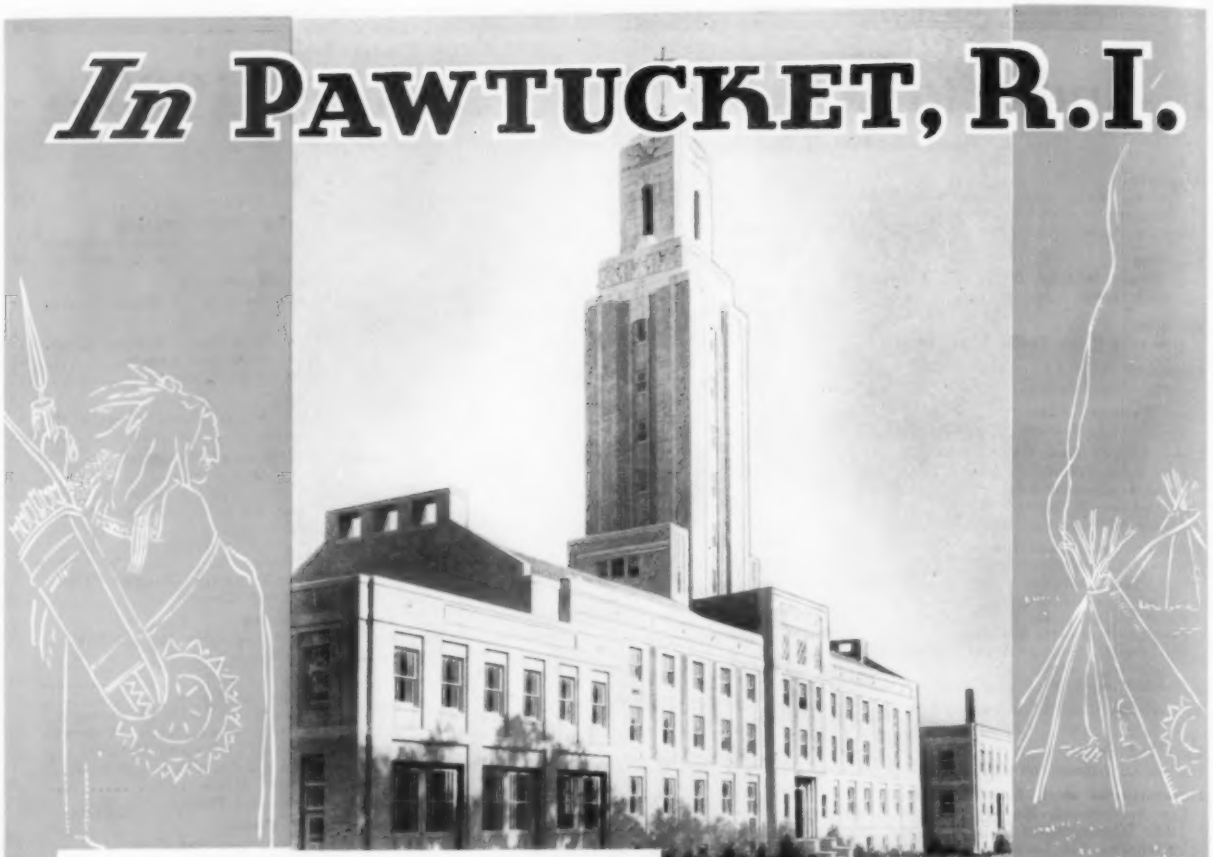
Water Supply and Water Works
Activated Carbon Solves Taste and Odor Problem, Denver..... 9
Why Water Should Be Softened..... 9
Handling Overdue Water Bills..... 9
Bill Collection; Times of Poor Business... 9
Private Company Comments on Collection.. 9
Construction with ERA Labor..... 42
Gloversville Water Supply Saved..... 47
Unusual Water Tower, Waukesha..... 55
Water Resources Committee Organized..... 62
President's Home Town Improves Supply.. 71
Remedies for Water Larceny..... 75
Rates, Service and Installation Charges, Hydrant Rentals, Sprinkler Costs, XVII. 95

Works Progress Administration
September 12 Dead Line for Applications.. 60
WPA Advisory Board..... 79
WPA Funds for Planning Studies..... 91

See pages 19, 20, 22, 109 for notices of catalogs and publications on municipal and civic subjects

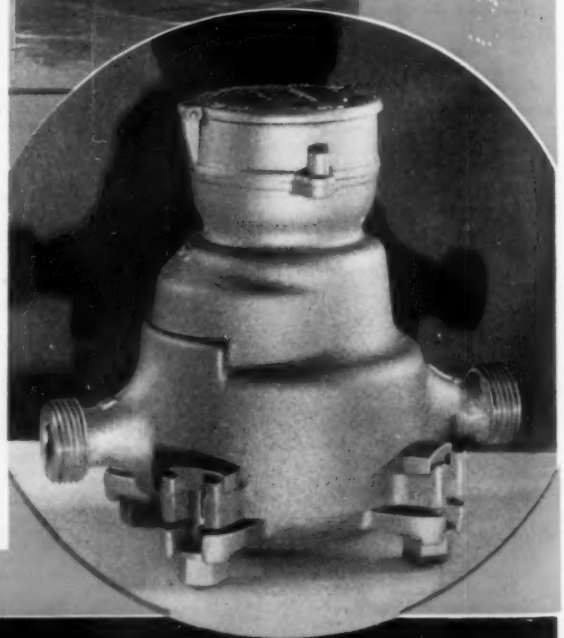
For Index to Advertisements see page 130

In PAWTUCKET, R.I.



It's a far cry from the teepee used by the Chief of the Narragansetts when ruling over his tribe, to the modern municipal building being erected through the efforts of Pawtucket's enterprising City Officials. This new structure, the first City Hall owned by the Municipality, will bring together under one roof, all departments of the local government. It is one of the most modern buildings of its kind in the country and the first P. W. A. project started in Rhode Island.

The old, out-moded method of assessing water rents at flat rates is likewise a far cry from the 100% metered system, such as has been in effect in Pawtucket for 25 years, with Pittsburgh Meters accurately measuring the consumption on each individual service and charges being rendered accordingly at just and adequate rates.



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Whence Comes the Money?

A Letter to the Editor

THE diagram on page 48 of your August issue is extremely interesting. [This is Secretary Ickes' chart showing distribution of PWA funds as of April 1, 1935.]

Would it not be even more interesting to show the other end of the picture, that is, the sources which fill the reservoirs from which such bountiful streams of money flow? In other words, who supplies the money? What classes of taxpayers contribute, and how much? How much do automobile drivers furnish through taxes? How much the railroads, users of gas and electricity? How much duties on imports, taxes on amusements, etc.? How much is to be passed on to posterity to pay?

R. W. DAVIS,
Cincinnati, Ohio.

The Editor's Reply

ACCORDING to the latest "Cost of Government" report of the National Industrial Conference Board, total Federal tax collections for the fiscal year 1934 were as follows:

Income taxes	$ 818,000,000
Processing	353,000,000
Miscel. int. revenue	1,470,000,000
Customs	315,000,000
	2,956,000,000
Less refunds	64,000,000
Net total	$2,892,000,000

The miscellaneous internal revenue taxes for the same year were subdivided on the basis of reports of collections as follows:

National Industrial Recovery Act taxes	$ 133,028,000
Estate tax	103,985,000
Gift tax	9,153,000
Distilled spirits, malt liquors, etc.	258,911,000
Tobacco taxes	425,162,000
Stamp taxes	66,761,000
Manufacturers' excise taxes:	
Gasoline	202,575,000
All other	187,470,000
Miscellaneous taxes	96,746,000
Total internal revenue taxes	$1,483,791,000

The last-mentioned total differs somewhat from the total for internal revenue in the preceding table for the reason that the figures in the second table are on the basis of reports of collections, whereas those in the first table are based on daily Treasury statements.

For the same fiscal year (1934) the above-quoted report shows gross total Federal expenditures of $7,243,700,000, from which should be deducted debt retirements ($359,900,000), tax refunds ($63,900,000), and District of Columbia expenditures ($35,800,000), leaving a corrected total of $6,784,100,000. The excess over total tax collections is partly accounted for by recoverable expenditures, such as loans and purchase of stock and debt obligations, "the liquidation of which," as the National Industrial Conference Board points out, "will result in excess credits and lower total expenditures for later years."

State and Local Revenues

For state and local revenues, the latest official figures are those of 1932, now available in a 1935 report of the Bureau of the Census, from which the following table has been compiled:

TOTAL REVENUE RECEIPTS OF STATES, COUNTIES, CITIES, TOWNS, VILLAGES AND BOROUGHS, SCHOOL DISTRICTS, TOWNSHIPS, AND OTHE CIVIL DIVISIONS: 1932

Taxes	
General property	$4,684,784,000
Inheritance	149,416,000
Income	101,725,000
All other	167,000,000
Poll	18,458,000
Licenses and permits	1,236,364,000
Total taxes	$6,357,747,000
Other Revenue Receipts	
Special assessments	321,165,000
Fines, forfeits and escheats	36,313,000
Subventions and grants	867,869,000
Donations, gifts and pension assessments	70,778,000
Highway privileges, rents and interest	256,106,000
Earnings of general departments	411,941,000
Earnings of public service enterprises	529,998,000
Total revenue receipts (Other than taxes)	$2,494,170,000

Net Debt—Federal, State and Local

According to an analysis of Federal finances recently issued by the National Industrial Conference Board, the gross debt of the Federal Government on June 30, 1935, amounted to some $28,701,000,000, or $1,648,000,000 more than at the close of the preceding year and $2,104,000,000 more than on August 31, 1919, when the war-time debt reached its peak. Gross debt less the net balance in the general fund amounted to some $26,860,000,000 on June 30, 1935, an increase of $2,388,000,000 for the year. On this basis the debt at the close of the year exceeded the 1919 peak by about $1,381,000,000. These figures of Federal indebtedness do not take into consideration the substantial assets represented by the loans and investments of the Reconstruction Finance Corporation and other offsets to Federal indebtedness such as PWA loans to local governments. In reply to an inquiry from THE AMERICAN CITY, the National Industrial Conference Board writes under date of August 28, 1935:

"With respect to your question in regard to the amount of Federal debt represented by loans, no satisfactory answer can be given, since those loans are made chiefly through subsidiary agencies utilizing government credit in various ways that may or may not be fully reflected in the public debt. On June 30, 1935, the Reconstruction Finance Corporation and other corporations and agencies financed wholly or partly by government funds had made loans to banks, railroads, financial institutions and individuals in the amount of $8,019,000,000, had purchased preferred stock, capital notes, and debentures in the amount of $876,000,000, and had made other investments, mostly mortgages, in the amount of $842,000,000. Full details by separate corporations and agencies are found in the Federal Reserve Bulletin for August, 1935."

Another favorable aspect of the problem of Federal finance is the substantial recent savings in interest rates resulting from refunding operations and easy credit conditions. At the close of each of the last six fiscal years the computed average rate on interest-bearing Federal debt was:

Fiscal Year	Computed Average Rate
1930	3.807%
1931	3.566
1932	3.505
1933	3.350
1934	3.181
1935	2.715

For state and local governments the net debt for 1932 (gross debt less sinking-fund assets) was some $17,589,000,000. Here again investments in public utilities and other "self-liquidating" indebtedness have not been included on the asset side.

Even if we combine the so-called "net" Federal and local governmental indebtedness into the substantial total of $44,449,000,000, there is no reason for terror if we consider in comparison the amount of our potential national income. Again quoting the National Industrial Conference Board's estimates, the total annual income of the American people was $83,000,000,000 in 1929 and $47,600,000,000 in 1934. If prosperity were restored to pre-depression levels through the stimulus of a bold and wise program of public spending, we should be able to retire the public debt at the rate of several billions annually with a substantially lower burden of taxation in proportion to income than we are now paying.

The range of profitable public spending for purposes stimulating to, and not competitive with, private industry is wide and inexhaustible. For the nation as a whole the net cost of well-planned, well-timed and well-administered public works and services can be financed in times of prosperity out of surplus income, and in times of depression through employment of productive ability that would otherwise be unused. When machinery and man-power remain idle, society loses in wealth much more than it saves in wages and taxes.

PROTECTING THE INVENTORIES OF MUNICIPALITIES

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•

The vast quantities of merchandise and materials necessary to operate the modern municipality's many departments and institutions represent a substantial investment. It is just as necessary to keep a constant check on these supplies as it is to protect the treasury cash. For that reason, control records should always be up-to-date, accurate; and items accounted for from every angle.

For many years, Burroughs has made an intensive study of this phase of municipal accounting. New machines, new features, new applications have been developed to meet every stores record requirement.

These machines are especially designed for faster and simpler posting, providing a daily control of stocks on hand, available and reserved, with perpetual balances of quantity and value, together with a complete analysis of materials charged to the various departments.

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Our Municipal Notebook

Municipal Power Plants Given Preference by PWA

TO give special attention to applications for publicly owned power plants, Public Works Administrator Harold L. Ickes has created a Power Division within the Public Works Administration. The Administrator's order setting up the new division stated that preference shall be given in all PWA state offices to the study of power projects.

Dr. Clark Foreman, of Atlanta, Ga., has been appointed Director, and personnel will be transferred from other divisions of PWA. No additional employees will be necessary.

Administrator Ickes stated that the Power Division will have jurisdiction over all power projects from the time they are received in the PWA state directors' offices until they are finally approved or disapproved. Examination of power projects will continue to be made by legal, finance and engineering examiners in the field, but in event it appears impossible for state offices to complete these studies in a reasonable length of time, the applications are to be forwarded direct to Washington by the state directors.

J. D. Ross, Superintendent of Lighting in the city of Seattle since 1911, has accepted the position of Chief Consulting Engineer for the new Division of PWA.

Samuel Becker, of Milwaukee, who heads the legal section, has been PWA attorney in Wisconsin. K. Sewell Wingfield, promoted from the Finance Division of PWA to become Assistant Director of the Power Division, is an engineer and has specialized in power projects.

Power Loans Wanted in 46 States

President Roosevelt has issued an executive order prescribing rules and regulations under which the Rural Electrification Administration may make loans for power and light projects in rural areas now without electric service.

Administrator Morris L. Cooke of REA has emphasized that a cardinal aim of the program to be carried out under the rules and regulations will be the employment to the utmost possible extent of labor from public relief rolls. Every effort will be made to draw 90 per cent or more of the labor for each project from these rolls.

Not less than 25 per cent of the entire expenditure on projects under any loan for an electrification project made to a public body, under the law must be expended for labor. While this provision, under the law, is limited to loans made to public bodies, it is believed that the proportionate outlay for labor on the projects of private utility companies, associations and cooperative organizations will be about the same.

Wage rates for persons employed on projects, except for supervisory, administrative and highly skilled employees, will be determined or approved by REA "in accordance with local wage conditions."

REA may also determine or approve the specifications for construction of projects, and supervise the projects.

The regulations make no provision for grants. Accordingly, REA will make funds available for project construction out of the $100,000,000 designated by Congress for rural electrification, exclusively in the form of loans. Loans may be made, however, for the entire cost of projects.

In carrying out the terms of the order, REA expects to make loans to both private corporations and public bodies.

In giving effect to the regulations REA will make self-liquidating project loans normally for 20 years, and normally at the low interest rate of 3 per cent. The same terms are contemplated for all classes of borrowers.

"We have been gratified," said Administrator Morris L. Cooke, "by the extremely wide geographical distribution of the applications for power and light projects and by the inquiries concerning proposed projects. Inquiries have come in rapidly and in large volume from every state in the Union. Forty-six states are represented by projects pending."

Well over half of the applications have come from states, municipalities, public power or utility districts and other public agencies. About 40 per cent have been filed by rural cooperatives. The private power companies have furnished only about 6 per cent of the total number of projects pending.

On the other hand, the contribution the private power companies are making to the program is greater than these proportions would suggest, because in a number of instances their projects are very much larger. Some involve several million dollars each, whereas some of those proposed by cooperatives, for example, range down to less than $10,000 each. Active cooperation is being given by both private and public interests.

The Parking Meters

"THE parking meters," writes John Watt, Chief of Police of Oklahoma City, "are going over in good shape. The public has accepted them and I have yet to find any one who has used them and is not for them." Any reader who would like to know to what Chief Watt refers is directed to page 61 of the August issue of THE AMERICAN CITY, which describes graphically the use of the little meter that makes people exclaim, "Why of course; why didn't I think of that!" Not that any one cares, but, incidentally, they promise to be quite a source of honest revenue for the municipality.

Wake Up, Municipal Plants!

FROM a rate-making point of view, one of the most progressive vendors of the mysterious energy is the Georgia Power Co. It offers its customers a regular rate and an inducement rate based on increased consumption over that of the corresponding month of a previous year. These rates in cents per khw are:

	25 kwh	100 kwh	250 kwh	500 kwh
Regular	6.48	4.57	3.33	2.06
Inducement ...	5.80	3.95	2.63	1.71

This incentive rate is available to the greater number of the 670 municipalities of Georgia. In 48 of these municipalities the town furnishes electricity. In one of these, Barnesville, the municipal electric department offers an incentive rate. The Barnesville light and water plant has the same rates as the Georgia Power Co. which also serves this town of 3,236.

The idea of offering a bargain rate to stimulate use, though long practiced in the retail trade, is new in the conservative field of electric power. But that it can be done when necessary is indicated by the action of Barnesville in meeting the inducement rate of their competitor. Municipal plants elsewhere should not wait to be shown how to sell electricity, but should study their market and then offer a highly attractive rate schedule considerably under the permissible rates for considerably larger consumptions of their product. In Georgia, as elsewhere, there is not enough difference between the rates for 100 kwh and 500 kwh. The company rate for the large consumption is less than half the rate for 100 kwh. The spread in the municipal rates is less than the Georgia power yardstick.

Air Conditioning

MANY cities maintain museums where the art of earlier civilizations can be seen; but few if any provide a running exhibit of modern practices about which most people want to know more and don't know where to turn for the information. Consider a single instance—air conditioning. It's on "everybody's" lips as "the coming thing"; but only the experts know where it is and what can be done about it now. Cities are beginning to ask questions from the standpoints of regulation and of actually equipping some of their buildings. Those that can afford it would do well to air-condition the municipal building, nt only to render it more habitable, but as an example for the townspeople to study. County courthouses thus equipped might, in addition to teaching the surrounding public something about mechanical weather, serve the ends of justice better on sultry afternoons. A further step would be to air-condition a smaller building—a historical house or branch library. Performed by an engineer, no one make of equipment need be featured; the idea being to show what air conditioning is, what it costs, its reliability.

ROCKY MOUNT POINTS WITH PRIDE ...

A VILLAGE of 1800 people in 1898 when the first water system was installed, Rocky Mount, N. C., has grown to a city of 23,000 today. More than keeping pace with this population increase, the capacity of the water plant has been stepped up during the same period from 125,000 to 3,000,000 g.p.d.

Also the latest improvements were not made to increase capacity but to decrease operating costs and to improve the pressures throughout the city. A Horton* elevated tank of 1,000,000 gals. capacity played an important part in this improvement.

Ample elevated storage permits the operation of pumps at a uniform rate and at maximum efficiency. It provides a reserve under gravity pressure in case of serious fires. It eliminates a great deal of the "low pressure" trouble at peak load periods.

There is an economic justification for a Horton elevated tank in almost any water system. Our nearest office will gladly give you facts based on the experience of cities with conditions similar to yours.

*Trade name for elevated tanks built by the Chicago Bridge & Iron Works.

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Boston .....1517 Consolidated Gas Bldg.
Birmingham .....1536 North Fiftieth St.
Dallas .....1241 Dallas Athletic Club Bldg.
Houston .....2919 Main St.
Tulsa .....1606 Thompson Bldg.
Los Angeles .....1103 Wm. Fox Bldg.
San Francisco .....1054 Rialto Bldg.

Plants in Chicago, Birmingham, and Greenville, Pa.

Activated Carbon—Water Softening—Collections

Activated Carbon Solves Denver's Water-Supply Taste and Odor Problem

THE taste and odor problem in the Denver, Colo., water-supply is not a serious one. The source of trouble is usually impounded storage water, and the trouble is due to the presence of certain taste-producing micro-organisms and vegetation. Copper sulphate was applied to the reservoir and the troublesome organisms destroyed. To remove the secondary odor which usually occurs after the sulphate treatment, activated carbon was used.

The carbon treatment likewise was used for the purpose of sweetening the water held in the Willard filters, the treatment lasting for several days. As no dry feed machine was available, a makeshift feeder was set up, using a barrel and a supply of water to thoroughly mix the carbon. The activated carbon was weighed out and certain dosages were applied ahead of filtration. The amount of carbon added was governed by noting the intensity of odor and taste in the filtered water. When the filtered water became free from the offensive odor and taste, the activated carbon treatment was discontinued.

At the present time we have installed dry feed machines at all mechanical filters, and these machines will be used to feed activated carbon to any water which may present a taste or odor problem.

GEORGE J. TURRE,
Chief Chemist, Board of Water Commissioners, Denver, Colo.

Why Water Should Be Softened?

THE water supply in a large number of cities and villages should be softened because:

1. Hard water destroys soap; makes household work more difficult; has a bad effect on clothes washed in it, on plumbing, heating systems, boiler tubes and shells; and is unsuitable for many industries.

2. Softening at a central source of supply rather than in thousands of homes is economically sound.

It is cheaper to pay a reasonable additional charge for centralized softening than to accept a hard supply, a portion of which must be softened in the home. All of us, whether we know it or not, soften some water each day, for it is necessary to use soft water to keep clean. All public water supplies contain some hardness, and that portion of the water in which soap is used must be softened to be effective. Soap has very little cleansing action until it lathers, and it will not lather until the hardness salts in the water have been neutralized.

The softening of water with soap is not only expensive but also objectionable because soap combines with hardness and forms curds, which are a troublesome and objectionable form of dirt. Curd adheres to clothes, turning them gray when ironed; combines with grease on dishes, making it difficult to render them bright and clean; produces deposits on the sides of bathtubs which are difficult to remove; and irritates the skin. The extravagance of removing hardness with soap can be appreciated when it is realized that a pound of lime costing approximately ½-cent will neutralize as much hardness as 20 pounds of soap costing approximately $3.00.

So-called laundry aids, such as borax, sal soda, and trisodium phosphate, are sometimes added to hard water to "break" it. This process of softening water is also unsatisfactory because these compounds are ordinarily just dumped into the water in a manner that results in over-treatment. Enough time is seldom allowed for these compounds to react with the hardness, with the result that the water is not satisfactorily softened. The presence of these unreacted chemicals in the water may have a bad effect on the skin or clothes with which they come in contact.

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Handling Overdue Water Bills

PRESENT business conditions have had a definite reaction on the ability of some customers to pay their water bills, so that bills of $10 to $20 extending back for a year have accumulated. If a person has owed $8, he has been allowed to work out his debt if he wanted to. We have done reforestation, which has provided a considerable amount of work. We have paid 50 cents an hour, $4 a day, for such work, giving two days' work to pay the water bill and an additional two days to provide a little money for the customer. Sixty persons have availed themselves of this opportunity, which has cleared the accounts and balanced our books. Everybody to whom we have made the suggestion that he work out his bills has been glad of the opportunity. We are planning to start some pipe laying, and have a number of men on the waiting list who want an opportunity to work out their bills on this job.

We applied a lien on fifteen or twenty properties a year ago where a sum of more than $330 was involved. All the bills were paid except $30. Such accounts as run back into last year and which were not paid by August 15 have been enforced through the lien law. The amount outstanding was included in the tax bill which was sent out on September 1.

ROGER W. ESTY,
Superintendent of Water Works, Danvers, Mass.

Water Bill Collection in Times of Poor Business

IN Concord, N. H., water-bill collections have come in remarkably well in spite of poor business conditions. The bills are levied against the owner of the property. The tenant is permitted to pay if he wishes, but the bill is made out to the owner. It has been necessary to be very diligent in collecting some of the bills, and many of them have been paid on the installment plan. Some men have been allowed to work out the bill by giving them a week's work cutting brush around the pine trees on the watersheds.

There was no lien law in New Hampshire until 1927, when such a law was passed making the water bill a lien on the real estate if in force a year from the date of the last bill. This law has been used in only two cases in 1932. Two firms went into bankruptcy and the Water Department received notice from them requesting that it join the creditors and thus take an assessment with the other creditors. The firms were notified that the water bill was a lien on the property the same as the tax bill, and both those bills were paid in full.

PERCY R. SANDERS,
Superintendent of Water Works, Concord, N. H.

Comments of a Private Water Company on Bill Collection

PRIVATE corporations are no more severe in the matter of collecting water bills than are publicly owned departments. Nashua, N. H., has a few customers who cannot pay now, and a few more who will never pay because of age, loss of jobs and a complete falling-away of future prospects. We do not believe that this is the right time, in a few cases, to shut the consumer's water off. In comparison with other lines of business our losses are small.

Municipally owned water works in Massachusetts and New Hampshire have a great advantage over privately owned ones. Both are business enterprises and trading operations. Privately owned companies are taxed and regulated and do not have state laws to help enforce collections. The others, city-owned, have the taxpayers' and the ratepayers' backing with practically no regulation or accounting control from without, and yet we find them confronted with a necessity for drastic methods of collection.

The private companies must pay their bills and follow the "golden rule." We truly can say that, with the use of the gentle method, our losses from non-payment of water bills are comparatively small.

WILLIAM F. SULLIVAN,
President, Pennichuck Water Works, Nashua, N. H.

Cotton Center Chooses Layne Water Systems

Mississippi Delta Cities Boast of Model Equipment and High Efficiencies

Below Memphis—stretching 300 miles southward toward the Gulf of Mexico—lies the great Mississippi River Delta, one of the most fertile spots on earth.

Down through the centuries, before man-made levees imprisoned it between high walls of earth, the mighty river each year sent its flood waters pouring out over the Delta to create a short-lived lake some 300 miles long and approximately 80 miles wide.

And in those flood waters was carried rich silt that the mighty Mississippi and its tributaries had gathered in their wanderings in 38 states.

"Raise Telegraph Poles"

Involuntarily, these states sent some of their richest soil to build up an alluvial deposit in the Delta so fertile, Delta natives say, "you can plant toothpicks and raise telegraph poles."

The rich, loamy soil under a hot Dixie sun is ideal for the raising of cotton, fine, white, long-staple cotton that each fall turns Delta fields into white, soft seas of unmatched beauty.

And a legion of cotton pickers each year gathers almost 1,000,000 bales of cotton of such long staple that it is matched by fibre from only a few other spots in the world.

Sent north, this mountain of cotton helps make Memphis the largest inland cotton market in the world.

Long Staple Ideal

Manufacturers seek it eagerly because the long staple is ideal for fine textiles, fancy spun goods and automobile tires.

This tremendous cotton business has fostered the growth in the Delta of scores of towns and cities, almost all of them known for their progressiveness and modern ideas.

The great majority rely for their water supply on systems of Layne Pumps and Wells. Layne-Central Co., one of the associate companies of Layne & Bowler, Inc., has built for these cities modern water supply systems that serve as models for other sections of the country.

Among the larger installations are those at Clarksdale, Miss., capacity of 9,000,000 gallons daily; Greenwood, capacity 12,000,000 gallons daily; Greenville, 5,000,000 gallons daily; and Leland and Yazoo City, each with capacities of 3,000,000 gallons daily.

Smaller, but no less efficient, are installations at Belzoni, with 2,500,000 gallons daily; Rosedale, 1,000,000 gallons daily, and Shaw, 1,000,000 gallons daily.

Lambert, Friars Point, Lula, Shelby, Crenshaw and Sledge, all boast systems of 500,000 gallons daily capacity.

Throughout the world, other Layne systems are winning new laurels for efficiency and economy in the service of industries and municipalities of every size.

The **BEST** „ „ *in their day*

TODAY municipalities and industries everywhere DEMAND the protection of modern, up-to-the-minute fire fighting equipment.

Yet, a scant 15 years ago, the picturesque, old horse-drawn engine still reigned as the bulwark of protection against fire for probably 40 per cent of American towns and cities.

But improvements and refinements in fire fighting equipment spelled its doom, just as even greater improvements and refinements in water supply equipment have rendered obsolete, systems that a few years ago were models of efficiency.

Today's system of Layne Pumps and Wells produce double and triple the volume of water from old systems that were the finest of their day. And, WHAT IS MORE IMPORTANT, they do it at a fraction of the former cost.

It will pay you to discuss your water supply problem with a Layne representative. Back of him is the rich, ripe experience of 50 years of service by the Layne organization to industries and municipalities the world over.

The coupon will put you in touch with him.

THINK:
OBSOLETE EQUIPMENT COSTS 30% MORE TO OPERATE

LAYNE PUMPS

AND WELL WATER SYSTEMS

LAYNE & BOWLER, Incorporated,
Department B, General Offices, Memphis, Tennessee.

Without obligation to me, I would like to discuss my ☐ water supply, ☐ deep well pumping problem with your representative. Please have him communicate with me.

*Name*_____

*Address*_____

Dust Laying—Brick Paving—Interdependence

Dust Layers

GRAVEL, cinder, slag, and stone roads are dusty in dry weather unless treated with a dust palliative. Dust is not only dangerous to traffic trying to drive through it, but also a nuisance and a detriment to the health of the people living along the roads.

The laying of dust is accomplished either by application of calcium chloride to the surface or by treatment of the surface with a bituminous material. The former method is much cheaper but gives only temporary results. Because of the cost, there have been no attempts made to lay the dust on all roads. Some very satisfactory results have been secured in Wayne County, Mich., by the application of several chloride treatments during the summer in front of dwellings through residential sections.

Approximately 7 miles of the more important gravel roads were given a bituminous treatment this past season with satisfactory results. The treatment consisted of a 3-inch surface of a mixture of gravel and asphaltic oil. It was mixed and laid out on the road with graders, providing a smooth, dustless surface for traffic.

LEROY C. SMITH,
Engineer-Manager, Board of Wayne County Road Commission.

Brick Parking Strip Effective

THE widening of Woodward Avenue, Detroit, Mich., inaugurated a few years ago with land acquisitions for a $10,000,000 right-of-way, has gone ahead during the last two years with the construction of a large overhead crossing and the laying of 2/3-mile of 90-foot paved roadway and two 15-foot sidewalks on a normal 120-foot right-of-way. Continuation of the widened pavement south for about ¾-mile is planned.

A sheet asphalt roadway with vitrified brick parking strips on a concrete base was adopted. The normal base slab is 10 inches thick except at junctions with the track encasement, where it has standard-type thickened edges 14 inches deep. Asphalt surfacing called for the usual two layers, a 1½-inch binder and a 2-inch wearing course.

Vitrified paving brick in the 6½-foot parking strips adjacent to the curbs were laid on a ½-inch compacted depth of mastic cushion composed of 92 to 95 per cent clean, dry sand by volume and 5 to 8 per cent asphalt cutback. The joint filler for the brick pavement was a pure asphalt applied at about 350 degrees F. Before applying the filler, the crew sprayed the surface of the bricks with a calcium chloride and starch solution, which prevented bonding of the asphalt to the top of the pavement and permitted easy removal of the excess asphalt. The solution was made up in the following proportions: calcium chloride, 100 pounds; water, 25 gallons; starch, 3 pounds. In hot weather the proportion of starch was increased. It was considered that brick parking lanes in asphalt street construction would eliminate softening of the asphalt surface caused by oil drippings from parked cars, and mark definitely and decisively the only permissible parking areas.

The Woodward Avenue paving project was designed and carried out under the general direction of V. B. Steinbaugh, Road Engineer, State Highway Department of Michigan, of which Murray D. Van Waggoner is State Highway Commissioner and Harry C. Coons Deputy Commissioner and Chief Engineer.

—From Dependable Highways.

The Services of Municipal Departments Are Interdependent

THE Thirty-Third Annual Report of the Department of Public Works, Oak Park, Ill., presented by Dudley C. Meyers, Commissioner of Public Works, depicts in a vivid manner the interlocking of various municipal departments and how much one depends upon the other for its effective operation. We reproduce below the three pertinent paragraphs on this subject from Mr. Meyers' report.

"The average citizen is very apt to take the services performed by government for granted; in fact, the services performed by government are taken so much for granted that people very often think they are free. We frequently hear the expression that parks, playgrounds, libraries and schools are free. They are not free but are paid for by taxes. If the citizens, who avail themselves of these facilities, paid for them when services were rendered, they would soon realize how dependent they are on these services and they would also realize that in most instances the cost is very reasonable; in fact, less than similar services of a private nature.

"While this attitude of the average citizen is true in regard to the general services performed by local government, it is particularly true in regard to the services performed by the Department of Public Works. Every citizen in the community is daily dependent in many ways on the services furnished through the Department of Public Works, which, as a rule, are performed so automatically and with such regularity that the citizen does not realize how much they mean.

"Most citizens in referring to their community will boast of the fine Fire Department, the fine Police Department, the efficient Health Department, but they have little to say about the garbage removal, sewage disposal, street lighting, street paving or water supply which are all functions through the Department of Public Works. All the fine fire apparatus and brave firemen would be of no avail if the Water Department did not furnish adequate water supply at proper pressure. The Police Department could not control the traffic and catch up with the speeders if the pavements were not properly constructed and well maintained, and nowadays we say that every street light is as good as a policeman. Citizens are familiar with the functions of the Health Department through contagious disease regulations, food inspections, etc., but very often they do not realize that the removal of sewage, garbage and other waste materials are functions directly affecting the health of the community and performed through the Department of Public Works."

Tests of New Fillers for Brick Pavement

THE new types of fillers for use in brick pavement construction that were developed in the laboratory of the Research Bureau of the National Paving Brick Association at the Ohio State University Experiment Station are to be tested in actual service in a brick pavement now being constructed under the supervision of the U. S. Bureau of Public Roads and the Ohio State Highway Department, on Ohio Route 31. There are fifteen sections of brick pavement each about 500 feet in length, in which different varieties of fillers will be used.

Observations will be made on a number of important factors regarding the fillers themselves as well as the traffic. These will include the exuding of the filler and a comparison of traffic effect on a brick surface course. This will be made possible because a large number of coal trucks carrying five or more tons use the Columbus-Athens road to carry coal to Columbus. These trucks travel light going to the mines, and use other lanes goin north when they are loaded. Studies will be made of the temperature gradient through the brick-cushion-base and subgrade, and a determination of the protective effect of brick surfaces on a concrete base will be made. At present no factual information is available on the temperature gradient through the various parts of a brick road.

The traffic resistance of motor vehicles on brick surfaces as related to the amount of exuded filler will also be studied. It will be determined whether separating agents affect the adhesion of the filler material in the joints. In connection with the use of "plastic sulphur," a new separating agent, an oil-water emulsion, will be tried. Studies will be made of the moisture-proof qualities of a surface course of brick. A record will be kept of the temperature of the heating kettle and occasionally of the temperature of the filler as poured from buckets. The surface of the filler should be chilled with water at certain points, and the effect of shrinkage in the joints on exuding noted. At various points brick will be removed from the finished pavement to note the penetration of filler.

When City Officials Favor Modern Office Methods . . .

BUSINESS MEN RESPOND WITH APPLAUSE

The Addressograph Method for automatically writing names and data saves time, increases efficiency and helps to keep the good will of taxpayers

BUSINESS men are always enthusiastic when municipal officials adopt modern Addressograph methods. It is natural for business men to recognize and appreciate the improvements which such methods effect because they have learned from experience that Addressograph is an extremely versatile device for performing many kinds of office work.

Addressograph has been used for over forty years to write names, addresses and other repeated data. It is essential equipment in offices of all kinds . . . business and governmental, whether Federal, State, County or Municipal.

The copying of names, addresses, property descriptions, license data and similar information by hand is a costly, uncertain method of getting work done. Addressograph writes names, addresses and data on a wholesale basis . . . accurately, speedily and at low cost. A complete record such as name, address, property description and valuation, for example, is written by Addressograph in one operation, at about the same speed with which one character is written on a typewriter. The work is always 100% accurate and perfectly legible.

Class 2700 Addressograph is one of more than fifty different models. It is extremely versatile and is extensively used in governmental offices. There is a wide selection of Addressograph machines . . . small, hand-operated models; intermediate, electrically-operated and large, automatic machines. See them in operation at your nearby Addressograph Sales Agency.

No matter how small or large your city or department may be, there is an infinite number of ways in which Addressograph can help you. A large portion of the drudgery in your office can be mechanized, routine operations can be simplified, work can be made easier, and better results can be secured in less time. Just mail the coupon below for complete information.

THIS LIST SUGGESTS HOW ADDRESSOGRAPH SERVES CITIES

TAX OFFICES

Lists property owners' names and addresses, property valuations and descriptions on tax rolls, delinquent rolls and bills. Speeds up tax billing, gets money in sooner and saves interest on borrowed funds. Makes installment collections simple and automatic. The outstanding tax collection records are made in cities where Addressograph is used.

UTILITIES

Writes customers' names and addresses, account and folio numbers on water, gas, electric, telephone and other bills. Fills in meter readers' forms. Does work in hours which formerly took days, in days which formerly took weeks. Accurate, speedy and efficient.

LICENSE BUREAUS

Fills in licenses with names, addresses, type of business, specifications, numbers. Fills in application forms, addresses envelopes. Makes the operation of a license bureau almost entirely automatic.

VOTERS' REGISTRATION BUREAUS

Provides self-copying lists of voters which may be used in many ways. Election notices, registration notices, sample ballots, etc., are easily mailed out. Election officials are quickly furnished with last-minute accurate list of registered voters.

STREET AND GARBAGE DEPARTMENTS

Organizing and routing workers for street cleaning, snow removal, garbage and rubbish collecting is made a very simple matter when Addressograph is used. Better service can be given to citizens which builds good will for the administration.

STORES DEPARTMENTS

Lists of materials and requisitions are quickly and accurately prepared with Addressograph. Tags and labels are quickly addressed. Inventory control is made easy, delays are avoided.

DISBURSEMENTS (Payroll, Relief, Suppliers, Bonds)

Addressograph writes names, dates, amounts, numbers and signatures on checks. It lists payroll, relief, accounts payable and bond holder's sheets. It fills in practically all forms used in disbursing departments. Makes the work accurate and automatic.

POLICE DEPARTMENTS

Lists Police Patrol Reports. Prints and addresses stolen car reports and addresses other criminal notices for distribution to other police departments.

SEND COUPON FOR COMPLETE INFORMATION

Mail the coupon at the right. The Addressograph Representative for your city will be glad to supply you with full details, without obligation on your part. He will work with you and help you modernize office systems. He will suggest methods which have proven successful in hundreds of government offices. A wealth of useful and valuable information will be placed at your disposal. Send the coupon now.

ADDRESSOGRAPH COMPANY
DIVISION OF ADDRESSOGRAPH-MULTIGRAPH CORPORATION
EUCLID BRANCH POST OFFICE • CLEVELAND, OHIO

ADDRESSOGRAPH COMPANY, CLEVELAND, OHIO.

Without obligation, furnish information about the use of Addressograph in connection with:

- ☐ TAX COLLECTING
- ☐ UTILITY OPERATION
- ☐ LICENSE ISSUING
- ☐ VOTERS' REGISTRATIONS
- ☐ STREET AND GARBAGE SERVICE
- ☐ STORES OPERATION
- ☐ FUND DISBURSEMENTS
- ☐ POLICE DEPARTMENTS

Name.....

Title.....

Address.....

Garbage Collection and Disposal

Incinerator Ruled Out Near Homes

THE town of Greenburgh, in Westchester County, N. Y., has been forbidden to erect a refuse incinerator in a residential zone within its corporate limits, by a decision of the New York State Court of Appeals. A 4-acre site was chosen for the garbage incinerator in a section that had been set aside by a zoning ordinance as a residential zone, highly restricted and allowing only the construction of one-family dwellings.

A group of citizens brought action against the town, contending that the erection of the garbage disposal plant was a distinct violation of the town's own ordinance. The town officials had proceeded on the theory that the town was superior to its own ordinance where the necessity of public health demanded. The trial court dismissed the complaint, the Appellate Division unanimously reversed it and the Court of Appeals affirmed the judgment of the Appellate Division.

Work of the Waste Collection Division in Cincinnati, Ohio

ACCORDING to the Annual Report of C. A. Dykstra, City Manager of Cincinnati, there were 375 full-time employees and 4 half-time employees in the Waste Collection Division in 1934. This Division, which serves a city with a population of 460,100 living in an area of 72 square miles, expended $449,935.05 in its work.

The report states: "Nowhere in the city service is there a finer spirit or a more loyal attention to the multitudinous details of public operation than in the Waste Collection Division. It is apparent to everybody that since the city took over this service in 1931, the nuisance feature of collection and reduction is at a minimum. Complaints about the service have become so negligible that lack of them is a matter of comment."

The policy of collecting combustible waste and garbage twice a week in the summer and once a week in the winter, and non-combustible waste once every two weeks in summer and weekly in winter, continues to work out most satisfactorily. In May, 1934, new cards to serve as reminders of this change, and copies of the revised rules and regulations of the division, were distributed to every householder. Many favorable comments made by the householders showed that this service was much appreciated.

The total cost tables below show a further decrease in unit costs, with the exception of incineration. This shows a slight increase of $0.006 due to the partial restoration of pay cuts and a small increase in personnel. The other two tables show a decreased total cost despite the partial restoration in pay cuts. All three charts indicate the efficiency and economy with which the division is operated.

Fewer Garbage Complaints in Milwaukee in 1934

DURING 1934 the Bureau of Garbage Collection and Disposal of the Department of Public Works, Milwaukee, Wis., received only 427 complaints for service from a population of 599,100. This compares with 650 complaints in 1933; 949 in 1932; 701 in 1927; 1,174 in 1926; and 23,858 in 1923, the last year before complete operation of the present trailer system.

Since 1923, the city has used side-dump trailers for garbage collection. Direct team hauls are made to the incinerators within a radius of approximately 2 miles. Beyond this distance the loaded trailers are made up in trains of four and drawn to the incinerators by tractor trucks. Household garbage is collected without direct charge. A charge of 20 cents is made for each can of commercial garbage of 20 gallons or less.

The incinerator plant, built in 1909, has four furnaces, each equipped with a 200-hp boiler. The steam produced in these boilers is converted into electricity, and the surplus amount of electrical current is sold. The incinerator completed in 1931 has three furnaces without boilers. The combined capacity of the two plants is 525 tons of refuse in 24 hours, based on a mixture of 60 per cent garbage and 40 per cent ashes and rubbish.

The city collected 43,175 tons of garbage during 1934 at a cost of $5.73 per ton, or 41 cents per capita. Including the privately delivered garbage, a total of 47,056 tons of garbage was incinerated at a cost of $121,681.70, or $2.58 per ton compared with $2.28 in 1933; the per capita cost being 20 cents. The net cost of operating the Bureau—administration, collection and disposal—was $382,808.28, or approximately 63 cents per capita, which are $15,622.36 and 2 cents respectively more than in 1933.

—From the Annual Report of the Department of Public Works.

COMBUSTIBLE COLLECTION, INCLUDING GARBAGE, CINCINNATI

Year	Tons	Total Labor Cost	Total Cost, with Overhead and Equipment Rentals	Labor Unit Cost per Ton	Total Cost per Ton
1932	86,220.2	$181,272.34	$324,515.28	$2.09	$3.76
1933	83,132.2	171,330.79	289,251.66	2.06	3.48
1934	87,241.6	184,063.07	300,075.41	2.12	3.44

NON-COMBUSTIBLE COLLECTION

Year	Cubic Yards	Total Labor Cost	Total Cost, with Overhead and Equipment Rentals	Labor Unit Cost per Cu. Yd.	Total Cost per Cu. Yd.
1932	273,012	$107,471.51	$188,993.23	$ .39	$ .69
1933	302,683	103,651.02	179,386.26	.34	.59
1934	320,881	107,508.24	178,345.74	.33	.55

INCINERATORS

Year	Tonnage Disposed	Labor Cost	Total Cost	Labor Unit Cost per Ton	Total Unit Cost per Ton
1932	95,536.9	$ 57,916.31	$ 89,955.48	$ .606	$ .941
1933	95,415.1	52,601.73	79,326.81	.551	.831
1934	99,225.5	61,923.44	83,093.21	.624	.837

Rubbish Collections in Akron, Ohio

THE collection of rubbish in Akron was instituted by the Street Cleaning Division, Department of Public Service, about fifteen years ago as an added service on those streets which are assessed for cleaning. One collection was made in the spring of the first year. In the years 1928 to 1931, six collections were made. In 1932 and 1933, two collections were made each year. Owing to the limited budget allowance, only one collection was made in 1934, and probably only one will be made in 1935.

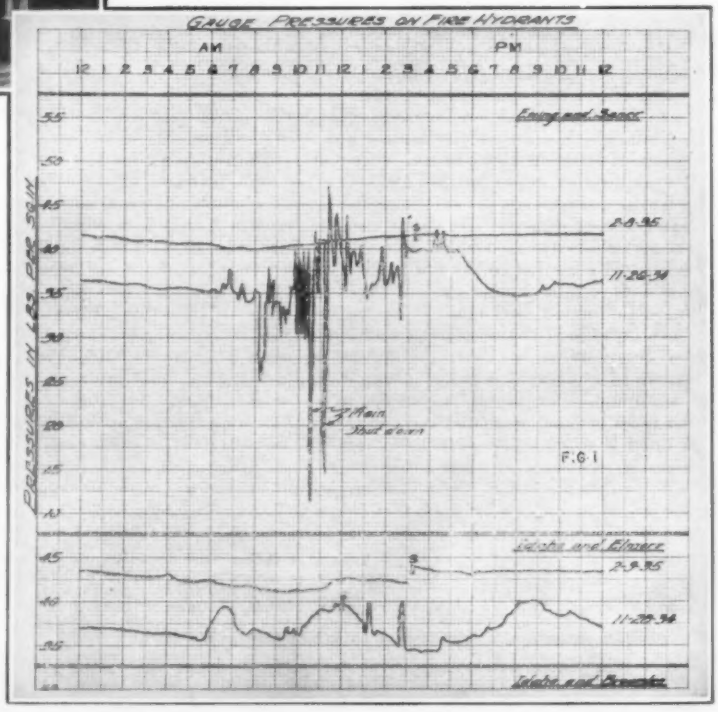
The city is divided into thirteen districts. Each district is of such size that its rubbish can be collected in one day with the equipment of the Street Cleaning Division. Each district is posted with signs on telephone poles three days in advance, giving residents notice and ample time to gather up the rubbish about their homes. All rubbish is placed in boxes, barrels, bags and other containers and placed at the curb on collection days.

A collection completed in May this year gathered 7,230 cubic yards of rubbish at a cost of 42 cents per cubic yard for collection and disposal. These figures include posting of signs, gas, oil, trucks, labor, etc. A total of 556 loads were collected, at a total cost of $3,056.18.

The rubbish is disposed of at various dumps throughout the city. All material which has salvage value, such as paper cartons, rags, iron, sheet metal, aluminum, barrels, baskets, glass, bottles, etc., is salvaged by the dump attendants. The proceeds from the sale of salvaged material are the only compensation received by the dump attendants. The tin cans, boxes and other refuse are then covered up with ashes and dirt, which is brought to the dump by private trucks.

HENRY DREYER,
Superintendent, Street Cleaning Division.

Results have certainly proven the wisdom of this Pittsburgh Des Moines Tank Installation at Dallas Texas



In January 1935, the city of Dallas put into service this 1,000,000 gallon Toroidal Bottom Tank. What it did to the pressure in the mains is vividly told by the "before and after" pressure chart, shown at the right. This increased and even pressure means satisfied customers, lower power costs for pumping, and additional revenue through increased water consumption.

Pittsburgh-Des Moines Steel Co.

3412 Neville Island, Pittsburgh
913 Tuttle St., De Moines
Room 915—270 Broadway, New York
1216 First National Bank Bldg., Chicago
1217 Praetorian Bldg., Dallas
619 Rialto Bldg., San Francisco, Calif.

When you write for that catalog, kindly mention THE AMERICAN CITY

Joint Meeting—Sewers—Sludge Digestion

Joint Sewage Works Meeting in October at Schenectady

A joint meeting of the New England and New York State Sewage Works Associations will be held at the Hotel Van Curler, Schenectady, N. Y., on October 4 and 5, 1935. Displays of sewage works equipment will be presented. On Saturday morning, the famous sunrise breakfast of the New York State Sewage Works Association with round table discussions, this time participated in by both Associations, will be followed by an inspection of the Schenectady and Canajoharie treatment plants.

The ladies are cordially invited to attend this meeting, and a committee is planning an enjoyable series of social events for their entertainment during the technical sessions.

Sewage Digester Gas for Power

IN June, 1934, a Clark 40-horsepower vertical 2-cylinder internal-combustion engine operated by sewage digester gas was installed at the sewage treatment plant in Newark, N. Y., and has been used continuously since that time to drive a Connersville blower. The engine is operated at 350 rpm.

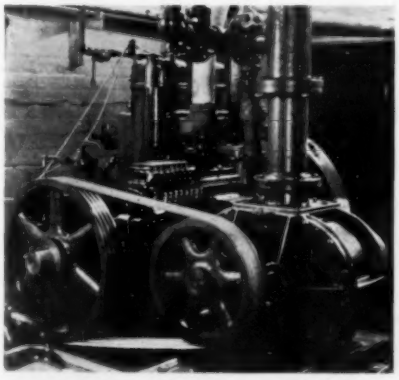
The sewage digester gas has the following analysis:

CO_2	27.7
Ill	0.3
O_2	0.2
Co	0.0
H_2	0.0
CH_4	67.7
N_2	4.1
Calc. Btu.	691.0
.3 x 2000 =	6
67.7 x 1012 =	685
	691 Btu.

The gas is taken direct from the holder to the engine without scrubbing. The fuel consumption is approximately 320 cubic feet per hour when delivering 300 cubic feet of air per minute. The engine is a 2-cylinder, 2-cycle Bobcat built with a speed range of 200 to 500 rpm. The 2-cycle principle gives a simple foolproof unit requiring a minimum of attention. The crankshaft of the engine is mounted on two roller bearings. The crankpin bearings are bronze, and the entire unit is lubricated by a mechanical force feed lubricator.

The engine and blower were installed in rather close quarters, since it was necessary to fit the unit into the space occupied by the old drive.

T. J. SMITH,
Chief Operator, Sewage Treatment Plant, Newark, N. Y.



GAS ENGINE USING SEWAGE DIGESTER GAS DRIVING CONNERSVILLE BLOWER AT NEWARK, N. Y., SEWAGE TREATMENT PLANT

UP HILL AND DOWN, OVER BRUSH AND AN OLD DUMP, BREAKING GROUND FOR SEWER CONSTRUCTION IN RICHMOND, IND.

Tractor and Bulldozer Aid Sewer Line Construction

THE photograph shows a LeTourneau Angledozer mounted on a Caterpillar Fifty tractor building a sewer line down the banks of the east fork of the White Water River at Richmond, Ind., This Federal project 8437 required the machine to work over an old garbage dump filled with tin cans, old car bodies and brush, but that did not make much difference to the equipment owned by the McKechnie-Pierce Co., of Cleveland, Ohio, contractors for the construction of this new line of sewers.

Sludge Disposal at Schenectady

OF the 15,179 cubic yards of sludge removed from the Imhoff tanks, in 1934, in Schenectady, N. Y., a total of 11,879 cubic yards was pumped to the ten sludge drying beds, and the rest was drawn to the lagoon. From May to October no sludge was drawn to the waste lagoon at the end of the plant site, this area being reserved for the sludge removals necessary to clear the undersized, shallow Imhoff tanks for the serious deposition loads of the coming winter. It is only by such foresight that the tanks and plant can be maintained without serious operating difficulties and nuisance production during the early spring.

A total of 95 bed applications were made during the season, thus providing an average of 9.5 fillings per bed. This is about normal for Schenectady and much higher than the usual bed efficiency produced by open drying beds in that climate. The wet spring of 1934 and equally wet autumn hampered sludge drying, and the removal of moist cake was necessary in order to keep the sludge-drawing program at its scheduled rate. The production of dried sludge was highly satisfactory in spite of these conditions.

A total of 3,563 cubic yards of air-dried sludge was produced, and it was estimated that 250 yards remained on the drying beds at the end of the year. Because of the wet condition of the sludge, marked drying and shrinking was noted in the storage piles, and greatly reduced quantities were available for fertilizer sale.

The beds were dosed to depths varying from 9 to 12 inches, depending upon the consistency of the sludge, the expected weather conditions, and the rate of cleaning provided by the sludge-bed crew of two men.

All the 1933 sludge produced was disposed of to farmers and local householders for fertilizer purposes. The 1934 sludge sale was somewhat hampered by the damp weather of the fall, but the major portion of the sludge in the storage fields was removed. The usual heavy demand in spring cleared the beds and the storage fields of all available fertilizer as in the past. Sludge has been sold at a price varying from 25 cents to 75 cents per load, depending on the size, most of the loads being of the smaller size.

—From the Twentieth Annual Report of the Bureau of Sewage Disposal, Schenectady, N. Y., MORRIS M. COHN, Sanitary Engineer.

PANIC —*The Worst Hazard in Schoolhouse Fires can be* EFFECTIVELY SAFEGUARDED AGAINST

by installing

GAMEWELL

DUALARM

SYSTEMS

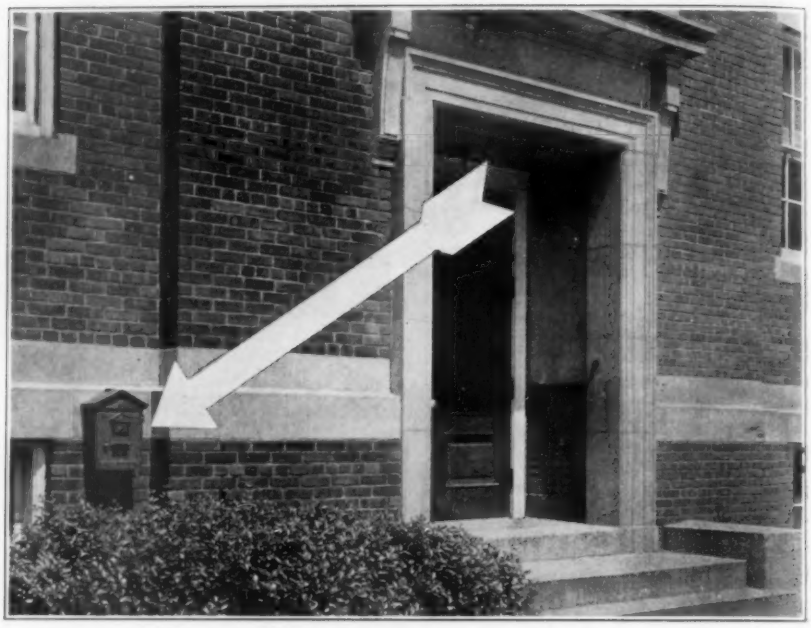


Photo shows how Needham, Massachusetts officials protect their school children. Arrow points to Master Type Fire Alarm Box which automatically calls the municipal fire department directly to the schoolhouse when DUALARM system, inside the building, is operated for fire.

SCHOOL fires of the past have taught a lesson which many fire department and school board officials have failed to heed — a lesson showing the vital need for protection against PANIC in schoolhouse fires.

PANIC has been the grim reaper of school children's and teachers' lives and the wrecker of human bodies in all major schoolhouse disasters of the past. In just six terrible schoolhouse fires, three hundred and fifty-three (353) deaths occurred—and PANIC was the largest contributing factor.

A PANIC is quickly created in a schoolhouse fire — the highly imaginative youthful mind being particularly susceptible to it. A mere wisp of smoke circulating from a small rubbish fire in a basement—a cry of "Fire" from the lips of a frightened child—then instantly, an orderly and happy group is quickly thrown into a turmoil—a stampede for the exits starts, while death and serious injuries follow.

The Gamewell *Dualarm*, a specially designed fire alarm system for schools, offers the most effective known protection against PANIC from a fire. It accomplishes the two most important things that should be done when fire is discovered in any school: (1) *Gets the children out safely*, (2) *Calls the fire department to the scene quickly and automatically.* The *Dualarm*, low in price, is the most complete and practical fire alarm system for schoolhouses that can be obtained. It requires no local battery that is likely to get out of order, and it costs nothing to maintain. Every fire chief and superintendent of fire alarm should urge his local school officials to install *Dualarm* Systems.

Write for a copy of our catalog leaflet No. 2002AC featuring the Dualarm Systems.

THE GAMEWELL COMPANY

"A Box a Block"

NEWTON, MASSACHUSETTS

Public Safety

Proofs That Police Radio Reduces Crime

JOE L. RUSSELL, Chief of Police of Clearwater, Fla., asks for answers to these two questions:

1. *Is it true that police radio is reducing crime in cities where it is now being used, and to what extent? What are the figures, if any, to prove this?*

2. *What types of police radio are on the market today, and what are the advantages of each type? What cities have chosen each type? And what have been their results to date?*

These answers are submitted:

1. Statistics aside for the moment, the best proof that radio is doing an effective job is the enthusiastic attitude shown toward it by those cities that have radio. Chief W. C. Liniville of Atchison, Kans., says that in his opinion radio is "the greatest aid to police work in the history of science." It stands to reason that this should be so because it puts headquarters in direct aural charge of its men almost as if the two were face to face.

But is radio actually reducing crime, and to what extent, and what are the figures?

For the first five months of this year, with a police radio, Evansville, Ind., reported reductions in crimes over the same period of 1934, when they did not have a police radio, in robbery, auto, theft, burglary, and petit larceny, as presented statistically in THE AMERICAN CITY of July, page 40.

For the same periods, the 70 cities over 100,000 population report decreases in robbery and auto theft, and slight increases in burglary and larceny. It seems obvious that the two best marks for radio attack are robbery and auto theft, both taking place more or less conspicuously and consequently subject to onlookers and reports to headquarters. Both these offenses have been decreasing steadily since 1931, when fewer than 50 cities in the country were equipped with radio, whereas 60 of the 70 larger cities now use it. The Government records show the trends of the major crimes. The figures for the five years 1931-35 (first five months) are as follows: robbery, 10,547, 10,049, 9,440, 7,704, 7,518, a drop of 29 per cent in 5 years and 3 per cent since last year; auto theft, 45,910, 39,111, 35,742, 32,509, 30,276, a drop of 34 per cent in 5 years and 7 per cent since last year.

Evansville reports a decrease of 42 per cent in robbery and 28 per cent in auto theft. And whereas for the 70 cities there were increases of 1 per cent and 4 per cent in burglary and larceny, the newly equipped Evansville Police Department reports decreases in these of 12 per cent and 8 per cent. In the important matter of arrests, moreover, there was a 34 per cent increase, so that there are now arrests in 30 per cent of the crimes.

2. The types of police radio on the market today are: one-way, high-frequency and low-frequency; two-way, simplex and duplex; and the so-called three-way and four-way. The low- or intermediate-frequency, one-way system has better carrying qualities or range than the high-frequency, but has certain interferences, and is more susceptible to electrical disturbances or storms. The high-frequency one-way is designed to operate in its own local area; consequently, there is less interference with other stations. A peculiarity is that it has a tendency to pick up stray ignition noises from automobiles. Two-way has the obvious advantage of the talk back, but there are complications in large cities that have kept them in the one-way column.

All two-way radio is high frequency. Newark, N. J., is the only very large city with ultra-high frequency and it is one-way. Other cities with one-way radio are Scranton, Wilmington, Camden, Norfolk, Chattanooga, and Fort Worth. The larger two-way radios are in Jersey City, Elizabeth, N. J., Evansville, Peoria, Kansas City, Kans., and Harrisburg.

McPherson, Kans., Fire Department Enlarged

THE accompanying photograph from City Clerk Ellen Lundstrom shows not only the fire trucks of the city of McPherson, Kans., but also Mayor E. C. Crary and Chief H. G. Lindgren on the tail of the Seagrave-Ford pumping engine leading the quiet parade. On the chassis of this pumper is a centrifugal pump of 500 gallons per minute capacity, with a 150-gallon booster tank, 200 feet of booster hose and 1,250 feet of 2½.

The second unit mounts an American-La France rotary 750-gallon pump, with 80-gallon booster tank, and the regulation hose.

The third unit is an International Harvester chassis equipped by the Anderson Coupling & Fire Supply Co. with 600 feet of 2½-inch fire hose, 200 feet of chemical hose, two 35-gallon chemical tanks, four 2½-gallon soda-acid hand extinguishers, and 88 feet of truss ladders.

The Seagrave-Ford unit is new, and the fire house was enlarged to include it with the other pieces of apparatus. The Chief and three firemen have been put on full time. Two men are always on duty, and ten respond when called. Fire loss in 1934 totaled $4,035 for this city of 6,147 population.

Why they all prefer the SAFETOP

THE FIRE CHIEF

When SAFETOP Hydrants are operated during a fire, their large standpipe with smooth interior gives full main pressure at the nozzle, their simple mechanism never sticks, and their double, positive-acting drip valves never fail to drain them completely after use.

THE WATER DEPT. SUPERINTENDENT

SAFETOP Fire Hydrants which have been accidentally broken by a smashing collision can be put back into service at less than 1/5 the cost of repairing other types of hydrants. This saving in fire hydrant maintenance expense will pay for many new hydrants during the course of a year in the average municipality.

THE TRUCK CHAUFFEUR

There are no fatalities or serious personal injuries if a skidding vehicle accidentally smashes into a SAFETOP Fire Hydrant. The Safety Breakable Section guards human lives as well as preventing heavy property damage and excessive hydrant repairs.

THE NEIGHBORHOOD HOUSEHOLDER

No flooded cellars or interruptions to water service if a SAFETOP Fire Hydrant is accidentally broken. The compression type inlet valve automatically closes tightly in case of breakage and the water service need not be shut off while awaiting or making repairs.

THE HYDRANT MAINTENANCE MAN

A broken SAFETOP Hydrant does not mean an emergency hurry call with serious incidental damage to be repaired. With a new Safety Breakable Section, costing $6.00, and a few standard tools, the repairs can easily be made by one man within half an hour.

Send for Bulletins describing the SAFETOP Fire Hydrant in detail.

The Kennedy Valve Mfg. Co.
Elmira, N. Y.

KENNEDY
SAFETOP FIRE HYDRANT
REG. U.S. PAT. OFF

SEPTEMBER, 1935

Vol. L, No. 9

The American City

470 Fourth Avenue
New York

35 Cents, $2 a Year

THE AMERICAN CITY advocates:

Streets and roads that are well built, well lighted, well maintained
An abundant supply of clear, safe, palatable water
Sanitary disposal of sewage and garbage
Fire and police departments properly trained and equipped
Traffic control for safety and facilitation; fewer grade crossings
Plenty of parks, parkways, playgrounds, and swimming pools
Banishment of slums, and building of well-planned home neighborhoods
Administrative efficiency and citizenship co-operation in bringing these things to pass

Cities Awaken to Value of Quality

Post-Depression Purchases Increasingly Made on Basis of Continuing Cost Rather Than First Cost

MOST purchasing officials of American municipalities have definitely reached the conclusion that it is not first cost which is of the utmost importance in the purchase of equipment, machinery and supplies for municipal use. The elected or appointed official naturally wishes to show savings in the operation of his department, but these savings can be brought about by proper organization and the careful elimination of waste, rather than through the purchase of "cheap" materials and equipment which may become the most expensive purchases in the long run. Municipal officials are being judged more and more by their actual accomplishment for the good of their departments and cities rather than by "grandstand" savings of a temporary vote-getting nature.

The bugaboo of contract awards, whereby a purchase must be made at the lowest price from the "lowest responsible bidder," has vanished through the writing of comprehensive specifications which insure quality from the "lowest responsible bidder" rather than an imitation of quality sold at a low price requiring expensive maintenance throughout the life of the equipment, and resulting in early obsolescence.

It is well known in the machinery field that the operation of most out-of-date equipment is expensive. Statistics show that such maintenance and operating costs together may be as much as 30 per cent more than the operating and maintenance costs of new equipment embodying the latest designs and power-saving devices. Early obsolescence is an earmark of bargain purchases which have heretofore been too popular with over-ambitious officials too anxious to obey the demand for lower budgets.

Buy quality and save money!

Water-Works Construction with ERA Labor

The New Water Purification Plant of the Salem and Beverly Water Supply Board

By **FRANK A. MARSTON**
Metcalf & Eddy, Consulting Engineers, Boston, Mass.

A PURIFICATION plant to treat the water supplied to the cities of Salem and Beverly, Mass., is being constructed for the Salem and Beverly Water Supply Board on the shore of Wenham Lake in Beverly by ERA labor. Construction was commenced in September, 1934, and is expected to be completed by the end of this summer. The plant is designed to treat 8 million gallons of water daily and will have a maximum continuous rating of 9.6 m.g.d. Provision has been made in the design for extending the plant in the future to double its initial capacity.

Salem and Beverly Water Supply Board

In 1913 the Legislature of Massachusetts passed an act establishing the Salem and Beverly Water Supply Board, which consists of the City Engineer of the city of Salem, the Commissioner of Public Works of the city of Beverly, *ex officiis*, and a third member appointed by the Governor of the Commonwealth. For many years prior to 1913 Wenham Lake had been used by Salem and Beverly as a joint source of supply, and since 1895 the supply had been supplemented by water diverted into this lake from Longham Reservoir. The general purposes of the 1913 act were to authorize the procurement of an additional supply for the two cities by conveying water from the Ipswich River to Wenham Lake; to authorize the purification of the entire supply at the lake; and to authorize the building of storage reservoirs. The Water Supply Board was given authority to operate and maintain the works constructed under the act and control of Wenham Lake and Longham Reservoir. Each of the two cities maintains and operates its own water distribution system.

Consumption and Quality

According to the census of 1930, the populations of Salem and Beverly are 43,353 and 25,086, respectively. Salem is an industrial community, in which relatively large quantities of water are taken from the municipal supply for industrial purposes, while Beverly is largely residential. The average water consumption of the two cities during 1934 was as follows:

Salem	4.97 m.g.d
Beverly	1.63 "
Total	6.60 m.g.d.

The purification plant is designed to take care of estimated 1945 requirements of the two cities.

The original water supply from Wenham Lake was generally clear and colorless and of good quality for drinking and other domestic purposes, but the diversion of water from Longham Reservoir and the Ipswich River into this lake has resulted at times in a considerable increase in the color of the water and the quantity of organic matter in it. In recent years, the color of Wenham Lake water has averaged about 40 p.p.m. At times the water has objectionable taste and odor, due to algae, as well as corrosive properties.

The drainage areas from which the water is derived are relatively populous, particularly that tributary to Wenham Lake, where the population is more than 310 per square mile. Bacteria characteristic of pollution are at times found in the lake, although the water pumped to Salem and Beverly generally has been safe for drinking. Water diverted into Wenham Lake from Longham Reservoir and the Ipswich River has been treated with chlorine.

Purification Plant

When the purification plant has been completed, raw water will be drawn from Wenham Lake by centrifugal pumps, located in a new pumping station, and will be raised to mixing tanks, where alum and activated carbon will be applied, together with soda ash, if necessary. The treated water will flow by gravity through four coagulation basins, and the settled effluent will flow to eight filter units. After the water passes through the filters, an application of soda ash or lime will be made to correct any corrosive quality of the filtered water. Provision will also be made for the use of ammonia and chlorine for treating either the raw water entering the plant or the filtered water as it passes to the filtered-water reservoir.

Low-Lift Pumping Station

Water will be drawn from Wenham Lake into the new low-lift pumping station through the present Salem intake, which is to be taken over by the Water Supply Board. In the station three pumps are provided, two of which have sufficient capacity to handle the usual rates of flow. The third will serve as a booster in times of unusual draft. These pumps are of the vertical-shaft, centrifugal type, direct-connected with electric motors. At a maximum head of 64 feet, the three pumps have capacities of 2,850, 4,725 and 5,850 g.p.m., respectively. The station also contains two vacuum priming pumps, designed to maintain the priming of the low-lift pumps.

Coagulation

The mixing tanks, situated in the chemical house, consist of two units with a total detention period of about 15 minutes. Revolving paddles, driven through gearing by electric motors, will mix the chemicals with the water. The tanks are constructed of reinforced concrete and equipped with sluice gates.

The treated water from the mixing tanks will be admitted to four coagulation basins through an influent conduit. The basins, with a total capacity of 1,345,000 gals., will afford a detention period of 4 hours at a flow of 8 m.g.d. Constructed of reinforced concrete, they have a

concrete roof with a cover of about 2 feet of earth over the top.

The travel of water through the basins is to be controlled by a wooden baffle in the middle of each unit. The baffle extends about 80 feet longitudinally from the headwall, allowing the water to pass around the end and return to the front of the basin and into an effluent conduit. The four units will be operated in parallel.

Filters

There are eight rapid-sand filter units, with a sand area of approximately 365 square feet each. The normal capacity of each filter box is 1.2 m.g.d., based on a rate of flow of 150 m.g.d. per acre, with the possibility of higher rates for short periods in emergency.

The filter boxes are of reinforced concrete, with a space between the rows forming the pipe gallery. The underdrain system consists of 3-inch cast-iron pipe, perforated on the underside. Steel wash-water troughs are located above the surface of the sand to collect the dirty water from washing the filter.

Water for washing the filters will be drawn from the filtered-water reservoir and discharged into the filter units by one of two pumps of the electric-motor-driven, horizontal-shaft, centrifugal type. These pumps have a capacity of 8,000 g.p.m. each at a head of 50 feet.

Lagoons are being built in a swampy area adjacent to the plant, to afford sedimentation for the wash water and the sludge from the coagulation basins. The overflow from these lagoons will finally flow back into the lake.

The filtered-water reservoir is constructed of concrete, with a groined-arch roof. The reservoir is 217 feet square, with a capacity of 4,000,000 gallons. From the filtered-water reservoir the water will be pumped to the Salem and Beverly distribution systems through stations operated by each of the cities independently.

Construction of the purification plant is being carried on by ERA labor, about two-thirds being supplied from Salem and one-third from Beverly. The crushed stone required in construction, approximately 7,000 tons, has been supplied from the Salem municipal stone crusher. Nearly all other materials, supplies and equipment have been furnished in the usual manner through competitive bidding and have been paid for by the two cities. It is estimated that the total cost of the completed plant will approximate $630,000.

The work has been carried on almost continuously, even through a most severe winter.

In spite of the fact that ERA labor is being utilized to construct this plant, the structures already built compare favorably in workmanship with the usual contract job. While the total cost of the plant will be greater than if done by contract, the project has provided worth-while employment to meet local relief needs.

The Salem and Beverly Water Supply Board consists of Charles Ross, Esq., of Boston, Chairman, Frank P. Morse, City Engineer of Salem, and James W. Blackmer, Commissioner of Public Works of Beverly. The purification plant was designed by Metcalf & Eddy, engineers, of Boston, who are supervising construction. John W. Raymond, Jr., of Beverly, is resident engineer, and James Walsh, of Salem, superintendent of construction.

THE MAIN STRUCTURE OF THE SALEM-BEVERLY WATER TREATMENT PLANT

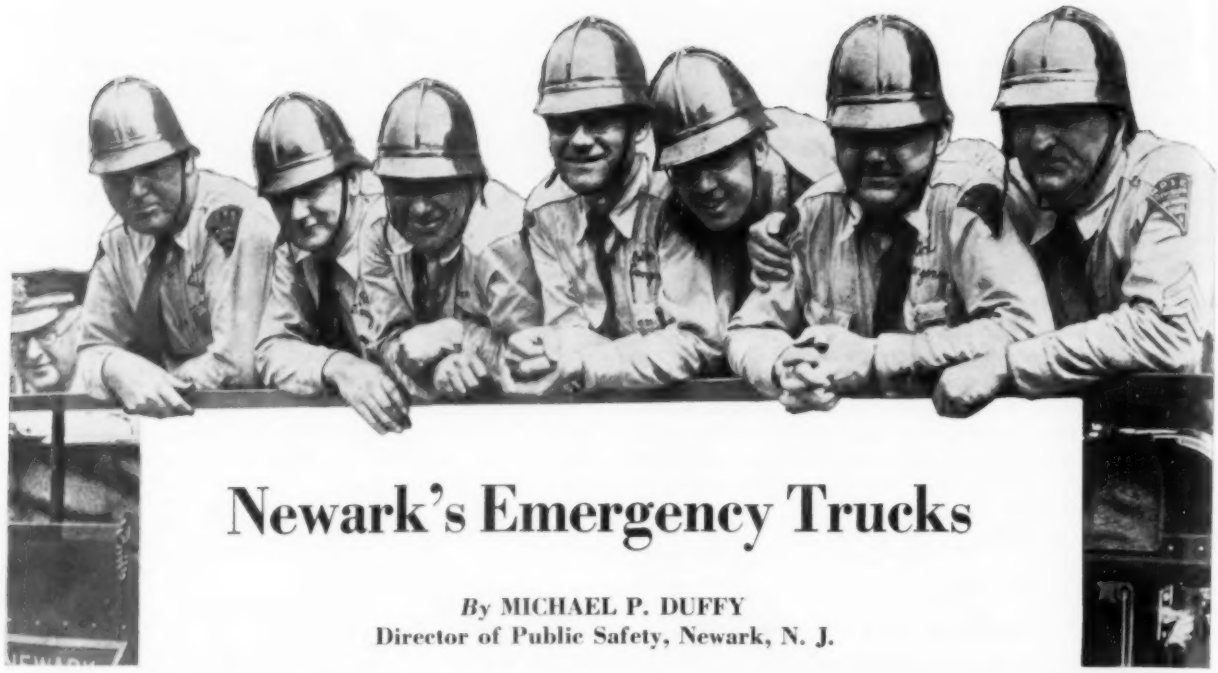
How Tax Limitation Laws Are Hurting West Virginia Municipalities

"THE people of Bluefield are becoming aroused over the plight of the city, which must have funds to continue to function. The state government hijacked the city tax sources, exhausting every known opportunity for securing more revenue. . . . All the cities of the state are suffering like privation from the same cause." Thus, in no uncertain terms, speaks the *Bluefield Telegraph* in behalf of municipalities.

New license fees, retail sales taxes, and gross sales taxes are being considered by Charleston solons. Graduated license fees on taxis, drays, barber shops, photographers, retail stores, gasoline stations, parking lots, theater tickets, and advertising signs met with strong disfavor from business firms. A tax on gross or consumer sales is proposed as a substitute measure.

Salary cuts for the Mayor, Councilmen, Chief of Police and the Street Commissioner were made this week in the 1935-36 budget of Chester just submitted to the Tax Commissioner.

—From the *News Bulletin* of the West Virginia League of Municipalities, for August 14, 1935.



Newark's Emergency Trucks

By MICHAEL P. DUFFY
Director of Public Safety, Newark, N. J.

The need for a mobile police unit with the mechanical ability, equipment, and speed to handle any kind of emergency in life and property has resulted in the rapid organization of the Newark Police Motor Patrol Bureau, whose major duties are: (1) to maintain the 94 police vehicles; (2) conserve gasoline and oil; (3) operate two new emergency trucks carrying 295 appliances, from machine guns and a 25-ton jack to half a gallon of water.

IN keeping with the modern trend in city police service, the Department of Public Safety of the city of Newark, N. J., organized in March a Police Motor Patrol Bureau, and since July 10 has developed a skilled personnel, drawn a code of regulations applying to the Bureau, and put into action two emergency trucks equipped for any call. This unit also inspects and repairs the Police Department's 94 motor vehicles, consisting of 31 Harley-Davidson motorcycles, 35 radio Fords, 4 Packard touring cars and a derrick truck, 5 Chryslers, 5 Chevrolet trucks, a Ford truck, 10 Reo patrol wagons, and the two emergencies—a new White and a converted American-LaFrance fire engine.

The first job of the newly organized Bureau was to get all the rolling stock into A-1 condition. The vehicles had formerly been apportioned among the four precincts and headquarters, each with a garage. While this work was under way, Captain Frank A. O'Neill, in immediate charge, wrote a full report of the organization, inventory, personnel, operation and calls. One set of figures covers the receipt and consumption of gasoline and oil.

Busy Emergency Trucks

Of all our vehicles, the most interesting at present are the two emergency trucks. A description of No. 1, the White that went into service in July, will serve for both. It is a new 85-hp truck built for 50 miles per hour on straightaway and 35 miles on hills. It makes this speed, moreover, loaded with its 295 items of equipment and its half-ton of men, all weighing 17,000 pounds. The special body was built by the Roeder Body Co., of Brooklyn, N. Y., at a cost of $850. The chassis cost $2,100 and the equipment $3,000. This $5,950 worth of action has already saved lives, not to mention property far exceeding the cost. To name a single run: a building containing a clothing distributor was collapsing, with 16,000 suits of clothes endangered; it was shored up and the stock removed without damage. As an example of ingenuity at the other extreme of the service, a large dog caught in the narrow space between two buildings was rescued by pouring oil over him, whereupon he slipped out safely.

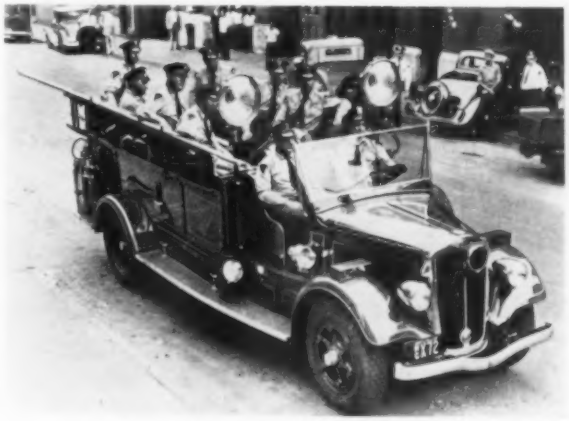
The truck and as much of the equipment as possible are painted Killarney green. The longitudinal facing seats have gum-rubber cushions; windshield, 1½-inch bullet-proof glass; large siren and a buckeye whistle. Neon direction lights in front show which way the truck will turn. The appliances, each in a place marked for it, include Curtis Lighting aerial projectors powered by a portable Homelite generator weighing only 80 pounds. There are Mine Safety Appliances masks and inhalators; pith helmets by Cairns Brothers; five bullet-proof vests; jacks that will lift to 25 tons; block-and-fall, and tarpaulins that can form a tent outside the truck. Then there are the inevitable firearms: Thompson machine gun; Winchester repeating shotgun; Federal tear-gas riot gun, gas billy, and Jumbo tear-gas grenade. All this equipment forms the base of a schedule of daily instruction on the following plan:

Monday: Block-and-fall; fumigants
Tuesday: First aid; refrigerants
Wednesday: Camera; inhalators; life belt; fire extinguishers
Thursday: Gas masks; acetylene unit
Friday: Life gun; rifles and machine guns; mobs
Saturday: Boilers; leaks; elevators

Crew comprises six patrolmen, driver, sergeant, lieutenant, consisting of such miscellany of practical talent as—aviator, electrician, carpenter, plumber, photographer,

electric-refrigerator mechanic, sprinkler expert. The men are rated on these counts: first aid, agility, swimming, acetylene work. The 53 patrolmen, 6 sergeants, and the lieutenant, put in an intensive six weeks of six days each on his own time on a first aid course of the American Red Cross and received certificates this August.

The fame of this service is spreading, as the letter from Dr. Martland shows, and the doctors are making increasing demands on it. There is a distinct advantage over an ambulance, in that there are six men instead of one, and resuscitation and inhalation work can be performed by two men better than by one. One morning, emergency service was called out to take care of a seven-weeks-old baby that was choking with whooping-cough—7½ minutes with the oxygen, and baby was O.K. Doctors have been advised that all indigent cases requiring oxygen, and all other cases of this character occurring early in the morning, will be treated gratis by this municipal service.



WELL-MANNED EMERGENCY TRUCK, NEWARK, N. J.

New Police Boat

Newark is actually a seaport, as war-time shipbuilding here could testify, and has both a bay and a river. Until August, 1935, the fleet of the Police Department consisted of one collapsible rowboat that can be unfolded and launched in a half-minute. In that month, however, a radio-equipped 16-foot Thompson motorboat driven at 35 knots per hour by a 24-hp Johnson Sea Horse outboard motor was put into service.

As one step in scientific safety work, we have made a survey of the hundred plants using an ammonia system of refrigeration. These establishments have furnished us with blueprints showing the locations of their ammonia shut-off valves, so that in the event of an accident no time will be lost by our crew in locating the remedy. At our suggestion, moreover, all these valves have been painted yellow as a means of immediate identification. The wisdom of this measure was proved in the recent case of an ammonia leak in the refrigerating system of a hotel, where the yellow valve was quickly located and the flow shut off.

My dear Commissioner Duffy:

I wish to take this opportunity of congratulating you on the establishment of the Motor Patrol and Emergency Division.

As Medical Examiner of Essex County, and as a member of the Board of Managers of the Society for the Prevention of Asphyxial Deaths, I have for some time recognized the necessity of the establishment of such units.

All over the country our Society has had great difficulty in calling to the attention of the medical profession and the laity the necessity of resuscitation methods in asphyxial deaths. The importance of this subject is realized when we make a rough estimate that about 30,000 deaths a year are due to the various forms of asphyxiation. There is no doubt that many of these people might be saved.

I hope the Emergency Unit will not be imposed upon, especially in the winter when pneumonia is quite common and there may be a demand for free oxygen, and that you will not be run ragged with calls to resuscitate the dead.

Marrison S. Martland.

MEN OF THE NEWARK EMERGENCY CREW EQUIPPED WITH SAFETY MASKS AND INHALATORS

Positive Planning Needed— Group Action Essential

Excerpts from Two Notable Recent Papers

By John Dower, of England:

A SYSTEM of town and country planning that merely imposes a negative and limited control over development is insufficient; it requires to be supplemented by a most positive planning that will give effective direction to the creative forces of development. The broad objective of a positive planning system should be to provide a physical setting of towns, villages, and open country adequate for the present and foreseeable needs of balanced economic and cultural communities. This can be achieved only by effective control over urban location and growth. Both central congestion and suburban wastage should be attacked by a planned redistribution of industry and population, in order to create a sufficient supply of new towns, both independent and satellite, compactly but openly developed on a background of permanent agricultural and other open country, and to decongest and remould existing towns, so far as possible to a similar form. . . .

It is clear that new towns cannot be healthy and efficient organisms unless their sites are well chosen for industrial development and their industries and populations grow in pace with each other. Equally, old towns cannot be made healthy and efficient unless steps are taken to prevent an excess or deficiency of industry and, in many cases, unless slum clearance is applied not only to worn-out dwellings but also to worn-out workshops and factories. To achieve these purposes some degree of control over the location and density of industries is obviously essential, while a wider control over the national distribution of industries will be required if the "depressed areas" problem is to be adequately tackled. Nevertheless, control of industrial location is a relatively new idea, not yet accepted by the nation, and it is obviously capable of very ill effects if unwisely or excessively applied. It should be planned and operated on a national basis, since individual towns and regions are too self-interested to apply it soundly in the national interest without central control; it should be applied in the first instance to directing new industrial enterprises to a choice of suitable locations (the removal of existing enterprises and direction to specific locations following later as found necessary); and it should proceed tactfully, flexibly and by persuasion rather than force.

The emphasis should be on the active encouragement of industries to establish themselves in suitable locations by such means as (a) the reservation of ample and convenient industrial sites, at low purchase or leasehold costs and so laid out and subdivided as to give room for easy expansion; (b) the provision of ample and convenient transport and public utility services, and in some cases of unit-type factory buildings for renting by smaller enterprises; (c) the promise by public authorities of ample and convenient housing, shopping, recreational, etc., facilities and general residential amenities for workers and their families, related in place and time to industrial development; and (d) the offer of low charges for power, light, water, etc., services from the start (in anticipation of future bulk demands), of loans at low interest rates to meet expenditure on buildings and fixed plant and, in some cases, of subsidies to meet removal and other initial costs. Industrial development in unsuitable locations should be discouraged by the withholding of such facilities, reinforced as necessary by the prohibition, save in special circumstances, of new industrial enterprises or of major extension of existing enterprises in congested areas and in districts of special landscape or agricultural value.

—Excerpts from a paper submitted by Mr. Dower, in collaboration with a committee on Positive Planning in Great Britain, at the International Housing and Town Planning Congress, in London, July, 1935.

By Luther Gulick, of the United States:

ONE of the most important facts of social and economic life: *the sum of the natural and reasonable activities of the individuals who make up a group may be extremely harmful to the group as a whole and thus to those individuals as well.*

A second fact: *Individual action cannot be relied upon to rescue a group from a disaster brought upon that group through the natural and reasonable action of individuals who form it.*

In this new world of planning the citizen has a much more difficult task than he has had in the past. The citizen of the future must, therefore, be prepared to think of himself as a member of a much larger group than in the past, and he must insist on national and world group planning. In the interests of intelligent planning and efficient administration of plans, the citizen will have to demand better men in government and insist that they play less politics and do more work, and that they are given adequate powers and continuity. When plans are developed, the citizen will have to make it his business to work with these plans, not against them. All of this will mean a strengthening of the influence of group action, that is, of government. In order that this may be safe, the citizen must insist on the maintenance of more rigid controls, and above all of the rights of freedom of speech, even for those with whom he does not agree, and freedom of education.

Human beings are by nature somewhat rational, somewhat fair-minded, and somewhat social. There is, therefore, no real danger of absolutism or slavery as the result of national planning if there is freedom of speech and press.

—From an article entitled, "Dust Gets in Your Eyes," in the *National Municipal Review* for August, 1935.

Gloversville Water Supply Saved by an Economical Plan

Impounded Waters Beat the Shortage—Winter Concreting with Relief Labor Handled Successfully

By **MORRELL VROOMAN**
Consulting Engineer, Gloversville, N. Y.

OPERATING complacently without plans for the future development of its water supply, the city of Gloversville, N. Y., faced a shortage of water when the drought of 1930 dried up several of the local streams. Temporary expedients cost over $30,000 for water and pumping and caused the withdrawal of two large consumers, with a loss of $8,000 a year income to the city. Ground-water deficiency when the 1933 drought arrived hastened the demand for a carefully planned enlargement of the entire system.

The Old Supply

Gloversville, having a population of approximately 23,000, is situated at the southerly edge of the Adirondack Mountains in Fulton County, and is the home of the leather glove industry. The domestic consumption of water, with services 100 per cent metered, is 65 gallons per capita, an average of 1,500,000 gallons per day. The tanneries require a considerable volume of water daily, varying with the amount of business but averaging 1,200,000 gallons daily. The system was built in 1877 as a gravity system, using several small mountain streams as the sources of supply. Because of the steepness of the watershed, the amount of rock and the relative imperviousness of the subsoil, the summer flow is small, necessitating storage.

In 1930 there were eight reservoirs with a combined storage capacity slightly over 100,000,000 gallons. The average yearly consumption of water for all purposes is about 900,000,000 gallons. The watershed areas supplying the reservoirs total 10 square miles. Two of these watersheds, with a combined area of 2¼ miles, are wooded, having been reforested with 750,000 pine trees, in addition to the natural growth of hardwood trees. They are entirely free from habitation, and are surrounded by 9 miles of 6-foot, 6-gage, 2-inch mesh, galvanized Cyclone fence. On the other watershed the land is entirely wooded and has no dwellings except one owned by the city and used by the caretaker. The city owns more than 800 acres surrounding the reservoirs on this watershed.

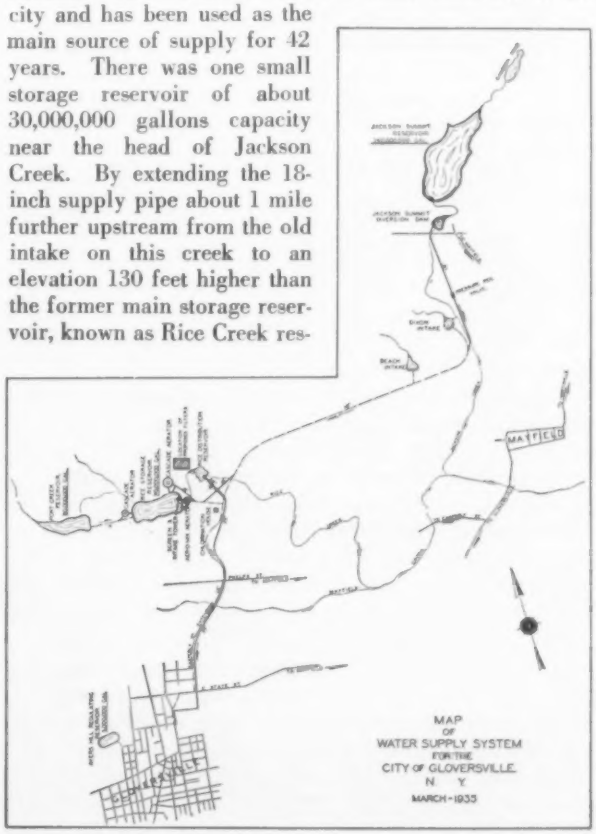
Effect of 1930 and 1933 Droughts

During the 1930 drought the total daily stream flow in August was 1,200,000 gallons, a deficiency at that time of about 1,800,000 gallons. This stream flow required a total stored reserve of slightly over 220,000,000 gallons. During this shortage 154,000,000 gallons of water was pumped, and a general curtailment in the use of water was necessary. The storage capacity of the existing Port Creek and Rice Creek reservoirs was increased during the fall of 1930 to 200,000,000 gallons by raising the height of the dams, and further additional capacity of not less than 120,000,000 gallons was recommended.

In 1933, owing to ground water depletion, the stream flow on the same watersheds was only one-half of the flow during the drought of 1930, or about 650,000 gallons per day. The draft on storage in August, 1933, was therefore greater than in 1930, and at the rate of 2.4 million gallons per day. Another more serious water shortage was averted by a prolonged strike of tannery workers which closed the tanneries for several months, thereby decreasing the demand for water, and it was not necessary to resort again to pumping.

Another Upstream Reservoir Completed

During 1934 the deficiency in storage facilities was remedied through building a 360,000,000-gallon reservoir on Jackson Creek, the main source of supply, since it had the largest watershed of the three contributory streams. This stream is about 9 miles northeast of the city and has been used as the main source of supply for 42 years. There was one small storage reservoir of about 30,000,000 gallons capacity near the head of Jackson Creek. By extending the 18-inch supply pipe about 1 mile further upstream from the old intake on this creek to an elevation 130 feet higher than the former main storage reservoir, known as Rice Creek res-



THE AER-O-MIX AERATOR AFTER 3 DAYS OF TEMPERATURES MORE THAN 20 DEGREES BELOW ZERO

ervoir, thus gaining additional head, the capacity of the 18-inch line was trebled. Water was brought to the Rice Creek storage reservoir and aerated before entering it. The waters from the Jackson Creek supply and the Port Creek supply are now brought into the 100,000,000-gallon Rice Creek storage reservoir through two cascade aerators. In this way the water from all sources is aerated, mixed and allowed to settle in the Rice Creek storage reservoir, which will be used in the future as a regulating reservoir and kept full at all times. This is the reservoir nearest the city.

When the 360,000,000-gallon Jackson Summit reservoir was filled the first time, the water stored in it apparently absorbed iron from the soil, for analysis of the water showed 2.25 parts per million of iron while the stream entering the reservoir showed 0.3 parts per million. The iron gave the water a color of 90, which borders on amber. There were also a disagreeable odor and taste from vegetable decomposition and absorption from roots and soil. The carbon dioxide content was 6.0 parts per million. Aeration, mixture and settlement in the 100,000,000-gallon Rice regulating reservoir has removed the taste and odor and most of the color, so that the resulting water is clear and of excellent quality.

The construction of this reservoir required the clearing of hardwood trees and brush from about 70 acres, the clearing of brush and weeds from 35 acres, the removal of over 10,000 stumps by pulling and dynamiting, the building of 4,800 feet of dirt highway, 16,000 yards of earth embankment, 2,000 cubic yards of reinforced concrete core wall, and 3,700 square yards of riprap, a regulating gate-house with two 20-inch and one 8-inch pipe through the embankment, and a reinforced concrete and stone masonry overflow spillway 50 feet in width.

The Jackson Summit reservoir work was all completed under CWA and TERA during a period of four months under severe winter conditions, during which a maximum of 240 men per day were transported a distance of 9 miles from the city and back again. The total construction cost was less than $100,000. Of this sum, $40,000 was for labor.

Old and New Supply Lines Interconnected

Rice Creek reservoir is located 3 miles directly north of the city, with but one 18-inch pipe line delivering the water from the reservoir to a 5,000,000-gallon pressure-balancing reservoir within the city, and a 1,000,000-gallon standpipe also within the city limits. When the reservoir was full, this pipe line had a capacity of 2.6 million gallons per day, which was inadequate to keep the balancing reservoirs within the city limits full. There was also danger of interruption of the supply to the city, should this 44-year old line break at any point.

To prevent any possible interruption of the supply, a new 20-inch cast iron pipe with Bitumastic enamel lining, supplied by the U. S. Pipe and Foundry Co., was laid parallel to the 18-inch line from the Rice Creek 3,000,000-gallon distribution reservoir to the city. This new 20-inch line has been cross-connected to the old 18-inch line with 12-inch pipe at five different points, and at two points with 18-inch pipe. Although the 18-inch line had been in use for 44 years, it was in excellent condition, free from encrustation, not pitted, and showed a reduction in theoretical capacity of about 10 per cent. The new 20-inch line paralleling the old 18-inch line to the city provides a dual trunk line with approximately three times the capacity of the single 18-inch line. This greater capacity was obtained by being able to keep the distribution reservoir full at all times and by using the 20-inch pipe with Bitumastic lining, which has a far greater capacity than the average 20-inch pipe with ordinary lining. Pit-cast pipe with lead joints was used on all this work.

The pipe lines, intake dam, and intake and screen tower were constructed by contract under PWA at a cost of $167,000, of which $52,650 was a Federal grant, making the total cost of the improvements but $267,000, exclusive of land and rights-of-way.

Provision has been made for the ultimate filtration and pH control between the aerator below the 100,000,000-gallon Rice regulating reservoir and the 3,000,000-gallon distribution reservoir.

Sub-Zero Concreting

The 360,000,000-gallon Jackson Summit reservoir, which has a maximum capacity of 430,000,000 gallons, using 2-foot flash-boards, was built in the winter of 1934, when on 42 days the temperature varied from 0 to 36 degrees below zero. During this time excavation was carried on with frost penetrating from 3 to 5 feet, and 2,000 cubic yards of reinforced concrete core wall was poured with excellent results. The main provision against the freezing of the concrete was the heating of all materials with wood obtained from clearing the 105 acres of pondage area. The mixing water was also heated and calcium chloride was added to the mix.

A new regulating and screen tower was built in Rice Creek reservoir, and the water drawn from the reservoir is further aerated through an Aer-O-Mix unit before going to the 3,000,000-gallon distribution reservoir, where it is chlorinated for delivery to the city. Severe winter weather has not interrupted the operation of the cascade aerator, although it was necessary to remove some ice from the outer walls of the two basins. The Aer-O-Mix aerator operated continuously without attention, and no ice formation occurred even when the temperature was more than 20 degrees below zero for several successive days.

Instead of seeking new and distant supplies, the existing supplies were developed and the system unified. The three different sources of water supply for the city have been combined into one, with the water aerated and mixed in one regulating reservoir. The same pipe lines and the same watersheds have been used, but their capacity has been increased, and the system is now extremely flexible and simpler to operate. There is now a combined total storage capacity of 60 per cent of the yearly consumption, or six times what there was in 1930. Owing to aeration, mixing and settling, the water is of a more uniform quality, is clearer, has less odor and taste, and requires a smaller quantity of chlorine for treatment. In making these improvements, none of the old works were abandoned, but they were knit together in a system greatly simplified in operation.

Should the future demand, the capacity of the system can be enlarged further without going to other sources of supply, by the simple process of raising the embankment, core wall and spillway of the Jackson Summit reservoir 15 feet. This will increase its storage capacity to 1,000,000,000 gallons. The run-off of the watershed is adequate to maintain this storage. No additional land or pipe lines will be necessary. Filtration can be provided between the Rice regulating reservoir and the distribution reservoir on land now owned by the municipality and so situated that the entire supply can be controlled from one point.

New Courses in City Planning at New York University and the Massachusetts Institute of Technology

THE School of Architecture of New York University announces a course in community planning designed to meet the needs of architects, engineers and others concerned with the problems of city and regional planning and the methods of developing planning schemes consistent with modern community needs.

As part of this course, consideration will be given to climatic and geographic influences, the distribution of population, the potential natural and other resources determining the growth of communities, the national trends in the distribution of urban centers in their relation to regional factors, as well as the relation of the present national program of public works to the future development of regional and urban planning. The economic resources available for planning and community building will be considered from the point of view of taxation, budgets, legislation, etc.

The course will also afford students opportunities for becoming familiar with the metaods of research required in the development of various town, city and regional plans, and the techniques involved in the preparation of plans, legislation and reports which are part of comprehensive planning.

The course will be under the direction of Dr. Carol Aronovici, who has had a long experience in practical planning in various parts of the United States and who has given courses of this kind in a number of universities throughout the country. He will be assisted by a number of experts in the practical field of planning and in subjects which have a direct bearing upon the scientific phases of planning theory and practice.

To assist the students in becoming familiar with the various methods of planning, an exhibit of plans prepared for various cities and regions throughout the United States and Europe, and other material bearing on planning, will be on display at the School of Architecture of New York University, Bryant Park Center, 1071 Sixth Avenue, when the course opens on September 24.

A MAJOR advance in the Massachusetts Institute of Technology's program of city planning studies is the introduction of graduate courses leading to the degree of master in city planning. Recognizing the fact that all planning problems depend for their best solution on the coordination of several fields, the new graduate curriculum will blend basic studies in engineering and architecture with elements of economics, sociology and government.

The new course is a furtherance of the present five-year curriculum leading to the degree of Bachelor of Architecture in city planning, which was created by the School of Architecture three years ago. The entire city planning program, both graduate and undergraduate, will be under the direction of Professor Frederick J. Adams.

A series of lectures by experts in the professional fields of city planning and housing will form an outstanding feature of the course. In addition to advanced studies in city planning research and design, the curriculum offers courses in planning and housing legislation and in city planning administration. These deal with past and present legislation, the powers and duties of local authorities, and other aspects of planning, such as zoning laws, building codes, and private deed restrictions. The administration course covers the organization and administration of planning projects in state, county, or region, as well as methods of securing appropriations for their preparation and development.

The Growth and the Opportunity of Municipal Power

IN current discussions of the economic and political implications of public versus private generation and distribution of electric current, the statement is often and truthfully made that notwithstanding the alleged advantages of municipal operation, the municipal plants generate only a small percentage of the total kilowatts consumed.

But examine the growth of the municipal plants as compared with that of the strongly entrenched central stations expanding under the urge of a continuously increasing demand for current and an avid market for securities. In the ten years 1922-32, the statistics of the U. S. Bureau of the Census show that municipal output increased 174 per cent; central stations 38 per cent. Municipal revenues increased 111 per cent; central station 31 per cent. Municipal capacity increased 190 per cent; central station 61 per cent. This expansion does not include the active municipal history of the last three years.

The Old Way

These increases in the municipal electric industry would have been still larger than they are if the municipal plant had always been regarded as a factory in which kilowatt-hours are made, instead of as a weapon, a threat, a retort, and a stepping stone. As long as the power issue was purely political, the municipal situation was bound to remain insecure. What one administration demanded, another could forget; what the outgoing administration had built up, the incoming could sell. Competent men appointed by an interested and public-spirited administration could be replaced by political henchmen with little if any technical or business background. It is not difficult to turn a prosperous property, whether public or private, into a liability—just leave it alone, show no interest, neglect its personnel and equipment; the natural process of decay will do the rest. It is not difficult to destroy the bright future of a property—don't develop it.

This is what happened in the case of many municipal plants. Municipal revenues came from taxes, and were reasonably plentiful. Real estate was sound and frequently booming; assessed valuations were being raised quite generally.

The depression changed the picture. Taxes became less popular, sometimes not being paid at all; the real estate market has been very sick and valuations, assessed and real, have gone low. New revenues were and are needed. Here is the chief reason for the growing interest in the municipal plant—it produces revenue, money. This is making it increasingly interesting in the eyes of public officials. It furnishes a source of revenue about which taxpayers cannot complain. It tends thus to lighten the tax burden, and in this way elicits interest on the part of those taxpayers who are informed on the matter. Some of them are. It can usually sell current, morever, at a lower cost to the consumer, owing to the smaller indebtedness, zero in many instances, and smaller overhead of a municipal plant.

Practically any fair-minded person will concede that the generation and sale of electricity is as much a municipal function, if the citizens desire it to be, as the provision, purification and sale of water, or the collection of garbage, or the collection and treatment of sewage. In each case, it is a service to all the people, to the entire community. If there were big money to be made out of the collection and disposal of refuse, this work too would be a matter of constant controversy. The reason it isn't is because it is confined to each town, and consequently runs to a few thousands, a few hundred thousands. If it were possible to tie this work together for a thousand towns so that the combined revenues ran to seven ciphers and stock could be marketed on it, the question of who should do this work would be highly controversial.

Another reason for increased interest in municipal power is the development of the diesel engine and the improvement of the small turbine, whereby electric power can be generated in small plants almost as cheaply as in large plants. In fact, in a medium-sized town of say 10,000 to 20,000 population, it is possible to place electric energy on the busbars for ¾-cent per kwh and in the home for less than 4 cents. Having achieved this through first-class engineering, equipment, operating personnel and management, all that remains to assure a profitable property is to set a rate that will a little more than pay cost.

To assure a highly profitable plant, one more item is necessary: a management that not only is technically efficient, but that promotes the use of the product. Dothan, Ala., population 16,000, charges 15.52 cents per kwh for 25 kwh and 2.92 cents for 500 kwh per month. The town of Athens, Ala., 4,000 population, sells TVA power at 3 cents and 1.38 cents respectively for these quanities. Consider the promotional influence of the Athens schedule: 25 kwh can be had for $0.75; 100 kwh for $2.50; 250 kwh for $5; and 500 kwh for $6.90. The lowest rate furnishes 20 times the power for 9 times the money. It is difficult to grasp what 500 kwh per month will do in the home; but it will light, toast, cook, refrigerate, wash and supply hot water. Present average consumption for the country runs from 40 to 50 kwhr, or about one-tenth this amount.

The Opportunity

With this tremendous potential market for domestic power, the municipal plant has a bright future. Electricity, for all its essential mystery, is a simple commodity to manufacture and deliver. Municipal plants are producing it successfully in towns of a few thousand population up to the largest cities. In the smaller places, a smaller quantity of technical knowledge with a sufficient element of mechanical ability goes a long way. In most instances, in the large towns as well as the small, the selling, marketing, promotional side has hardly been developed. But this will change with increasing understanding of the rewards to both plant and community from greater use of electricity.

Lighting, Radio and Heating for New York's Floyd Bennett Airport

By DANIEL H. REED
Consulting Engineer, New York City

THE improvement of New York's principal airport in the Flatbush section of Brooklyn, by the installation of a heating plant for the hangars, radio control, gasoline and oil storage, passenger facilities, and grading the entire airport, is the outstanding job credited to relief workers. It has cost a million to date and will cost 1½ millions, was organized only last October, and constructed during the winter by a force of 500 men and 60 engineering and chemical workers.

Despite the usual obtacles to efficient progress inherent in relief work, the performance compares favorably with skilled contract operation. Skilled mechanics were permitted to work only five days per month, and common labor fifteen days, which brought on each week a new gang of steam fitters, bricklayers, carpenters, electricians, plumbers. Purchasing was done through several departments, requiring a month to six weeks from requisition to delivery. Work had therefore to be planned one to two months in advance. The 34 jobs of this project involved:

Shop and boiler room with 400-hp heating plant to heat 4 hangars and administration building
3,000-foot pipe tunnel connecting all buildings
3 radio buildings for remote-controlled radio
1 runway localizer beacon
Offices for tenants
60,000-gallon storage
Alterations to administration building comprising restaurant, ticket offices, underground loading for passengers, mail, express
Grading and rolling, dry sumps for field drainage
3,500-foot runway

The 50 x 100-foot shop building was erected between hangars 1 and 8, joining them together as shown on page 52. Light is provided by the saw-toothed roof. One end of the shop building serves as boiler room, and above this room are lockers and toilets for the machinists. Concentrated loads are carried on 30-foot Raymond concrete piles driven to 30 tons.

The heating plant is designed for low-pressure mains with vacuum return lines. Two 184-hp National steel boilers equipped with four Todd rotary oil burners of 150 hp each, heat four hangars, shops and offices. A third boiler can be installed to heat additional hangars, and a second heating plant will be built at the opposite end of the airport between hangars 1 and 2, and the two plants connected by an 8-inch main.

Each hangar is heated by three blower type unit heaters mounted overhead with a servicing catwalk in the trusses. The unit heaters nearest the doors are provided with thermostatically controlled air by-pass dampers which permit warm air to be recirculated downward, thus saving fuel. The motors operating the blowers on the units near the hangar doors are automatically shut down when the doors are opened. The third heater is placed in the center of the hangar and is controlled by a thermostat only. It is used for automatic night operation and is also cut in during extremely cold weather. The heating equipment will heat the hangars, which are 120 x 140 with 22½-foot headroom, to 60 degrees F. when the outside temperature is zero. Steam is distributed from the boiler room to the various buildings in an 8-inch main carried in a pipe tunnel 3½ feet wide by 5-2/3 feet clear headroom. The

McLaughlin Aerial Surveys

VIEW OF FLOYD BENNETT AIRPORT, LOOKING NORTHEAST
Showing dock to accommodate seaplane ramp for transfer of passengers by air from skyports in the East River

STOCK ROOM AND SHOP BETWEEN HANGARS

main pipe tunnel runs almost the entire length of the airport along Flatbush Avenue, a distance of 3,000 feet with cross tunnels connecting the various buildings.

A lean-to of hangar 7 contains the airline offices, the weather room, and the radio dispatch office, which juts out from the weather room and has windows on three sides to give a clear view of the entire airport. The location and size of Floyd Bennett Field with its clear approaches should permit the completion of transcontinental schedules in any weather when the radio and auxiliary lighting equipment are put in operation.

Buildings housing radio equipment have no windows and are ventilated by louvres. Transmitter and receiver stations are 1½ miles apart. Poles for transmitter antennas are 60 feet; for receiver, 30 feet. They are marked with double-lamp obstruction lights. The radio range beacon is located 2½ miles northwest of the airport, and one leg of the beacon serves as a runway localizer, marking the airport in a NW-SE direction for 6,000 feet. It is remotely controlled from the control tower on the administration building. The beacon, which is similar to class B markers used by the Bureau of Air Commerce, will send out call letters identifying Floyd Bennett Field. The control room has seven RCA airport receivers mounted in a single rack, making it possible to have a receiver tuned in at all times on the individual wave length of each of seven operators. Augmenting the runway localizer for blind landings, is a row of powerful lights placed between the north edge of the field and the beacon station.

A double row of flush type runway lights will outline the runway, and radio marker beacons will indicate to the pilot the edges of the field lying in the path of the runway localizer beacon.

To distinguish the approach lights at the end of the runway, it is planned to vary the voltage periodically on the lamps from a low voltage that will barely make the filament glow, to a high voltage that will produce a bright incandescent filament able to penetrate fog for a distance of 300 feet. This system of lighting was worked out jointly with L. C. Simpson, of the American Gas Accumulator Co., Elizabeth, N. J.

The new runway of reinforced concrete will coincide with the beam of the localizer beacon and will be 147 feet wide, instead of 100 feet as are the other runways, to facilitate blind landings. Flush-type lights spaced 200 feet apart and staggered will light the runway, producing a series of light beams directed upward. They guide the pilot in leveling off for a landing and in taxiing a plane on the ground when visibility is poor.

Gasoline Storage for 150,000 Gallons Planned

Bulk gasoline storage for 30,000 gallons is already provided, and a second unit is under construction. The first unit consists of two 5,000-gallon tanks salvaged from two air receiver tanks and two 10,000-gallon tanks, all connected by a 4-inch header leading to two gear-type pumps of 100 gallons per minute.

The pumps are cross-connected to permit handling of both 80 octane and 87 octane gasolines when required. Eventually there will be four 30,000-gallon units opposite the double rows of hangars, all connected by a fill line to the dock, for handling barge shipments.

The improvement of Floyd Bennett Field with relief money is a credit to the city administration under Mayor Fiorello H. LaGuardia, a former war-time pilot. It is supervised by Commissioner John McKenzie and Deputy Commissioner F. William Zelcer, Department of Docks, through the employment of engineers, draftsmen, mechanics and laborers from the Works Division of the city relief organization headed by Colonel William J. Wilgus.

NEW 400-FOOT ADMINISTRATION AND TERMINAL BUILDING, NEWARK, N. J., AIRPORT

A Permeable Jetty Builds Up Kenosha's Beach Line

By SYDNEY M. WOOD
Lake Bluff, Illinois

A PERMEABLE jetty as a means of controlling littoral currents and beach erosion has recently proved successful along Lake Michigan near Kenosha, Wis. The jetty was built of precast concrete units so placed that strong currents parallel to the shore—littoral currents—could pass through it, retarding them only enough to cause transient beach material to be dropped on both sides.

As an indication of its effectiveness, the jetty, built late in 1934, caused more than 20,000 cubic yards of fine sand to be deposited on the adjacent beach within a few weeks. This is an unusually rapid rate of fill for this location.

Similar jetties of permeable construction have been highly efficient along the Wisconsin shore at Shorewood and Cudahy.

The Situation at Kenosha

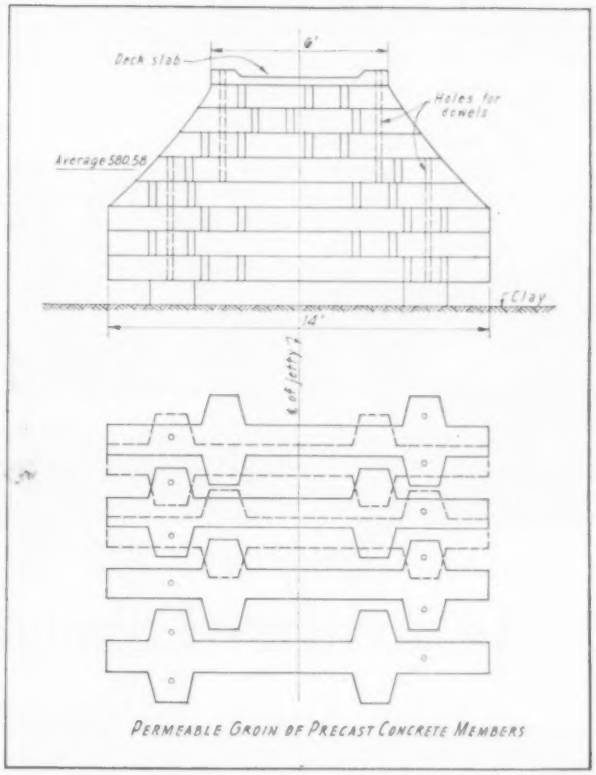
In common with other towns on the west shore of Lake Michigan, Kenosha has suffered severe land losses. These occur at an alarming rate at high-water periods of the lake. A careful study has indicated that in large measure the erosion at Kenosha is due to the effects of the long harbor piers that were built many years ago. The destructive effects were aggravated through the construction of a breakwater built to reduce wave action near the harbor entrance. The breakwater and the piers create a funnel through which currents pass at great velocities.

The protection work done is located about one-half mile north of the harbor and is intended to create a bathing beach and protect a bathhouse built by the city in 1934. This property was endangered and partly overrun by storms in the high water of 1929.

Jetty Construction

The jetty is the first unit of a system planned to protect the coast against erosion. The beach here, formerly of coarse gravel which sloped rapidly into deep water, is now considerably flatter, and fine sand predominates, making it ideal for bathing.

CENTRAL SECTION OF JETTY, SHOWING PRECAST CONCRETE CONSTRUCTION



PERMEABLE GROIN OF PRECAST CONCRETE MEMBERS

The jetty construction constitutes a radical departure from usual methods, and yet it is simple in theory and design. Precast concrete blocks are held in place by iron rods as shown. The blocks are so arranged that the degree of permeability increases toward the seaward end of the jetty. The shore end may be either solid or permeable; the sand deposited on both sides quickly makes any type impermeable at this end. At the seaward quarter-length, it is important that the jetty be at least 50 per cent open in order to avoid seaward deflection of the littoral current. For the central portion intermediate-sized openings are required.

The jetty was founded upon a stratum of firm clay a few feet below the water level. The openings through the jetty were varied by controlling the type of lugs built on the precast blocks. The jetty is 14 feet wide at the bottom and 6 feet wide at the top. In order to reduce the effect of wave action, the upper part of the jetty was tapered by using beveled blocks of different lengths. Reduction in width near the top increased the permeability and aided in proper progressive sedimentation. A solid deck will be provided for a walkway.

The shore end, 160 feet long, required 0.7 cubic yard of concrete per lineal foot. The central portion is 190 feet long and required 2.0 cubic yards per lineal foot.

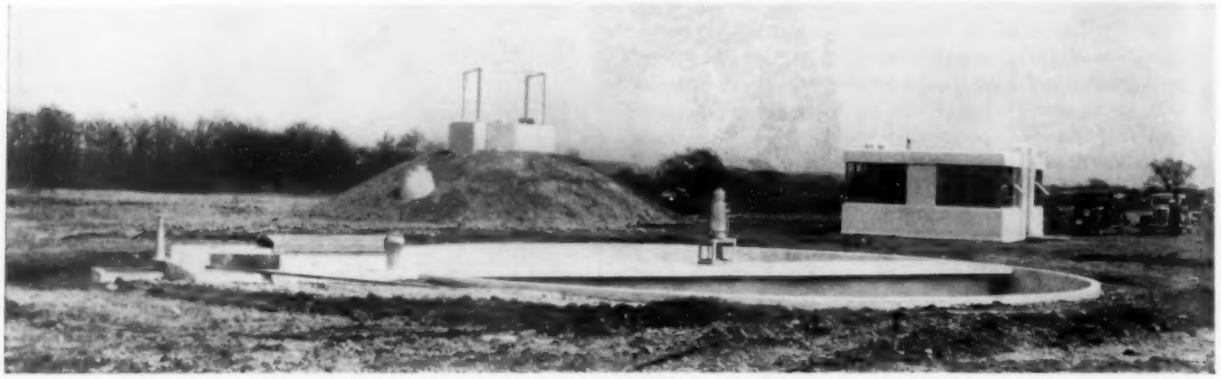
Construction of the seaward end of the jetty, which will be very open, is deferred until a later date. The seaward end will probably require the use of concrete piles, so spaced as to give the desired permeability.

Theory of Jetty Action

The problem along the Kenosha shore was approached from the standpoint that the best protection against erosion is a wide sand beach with a flat slope, and resolved itself into finding the most economical method of forming and maintaining fine sand deposits. Experience had shown that walls parallel to the shore line do not encourage beach building. When constructed, they are generally of secondary importance, being used in connection with jetties, which are the primary means of shore protection and beach building.

Jetties perpendicular to the shore line are built to interfere with the shore current. For proper action, the jetty should not stop or deflect the current but should retard its velocity only sufficiently to make it drop its burden of material.

The jetty work described was done for the city of Kenosha, the writer acting as consulting engineer.



GENERAL VIEW OF THE ACTIVATED SLUDGE TREATMENT PLANT AT MENOMONEE FALLS, WIS.

An Activated Sludge Plant for a Village of 1,300 Population

By **ROBERT CRAMER**
Consulting Engineer, Robert Cramer & Sons, Milwaukee, Wis.

A NEW sewage disposal plant has just been completed for the village of Menomonee Falls, Wis., which is located in Waukesha County, just outside the Milwaukee County line. Although this plant serves only 1,300 people, it has been designed to use the activated sludge process in order to effect the complete purification necessary because the effluent from the plant is discharged into the Menomonee River, a small watercourse which flows directly into Milwaukee County and eventually into Lake Michigan. The State Board of Health required this complete treatment because the Menomonee River is one of the principal means of draining the metropolitan district of Milwaukee, in which all waste is now completely treated by the activated sludge process.

The plant is located directly south of the village and receives all the sewage from the village through a new main sewer constructed in 1934. At the plant the sewage is lifted 7 feet into the plant. It is first taken through a primary settling tank which is equipped with Straightline sludge-removal mechanism and scum removal. Sludge and scum are removed intermittently by means of a sludge pump and delivered to the digester.

Aeration

The clarified sewage enters one of two aeration tanks, each of which is equipped with an American mechanical aerator. From the aeration tanks, which can be used either singly or in series, the aerated mixed liquor enters the final settling tank, which is equipped with the same type of sludge-removal mechanism as the primary tank. The settled activated sludge is partly returned to the aeration tanks, the surplus being pumped into the digester.

A novel arrangement has been used for the return of activated sludge to the aeration tanks which makes the use of a return sludge pump unnecessary. The operation of the American aerator establishes a difference in water level between the main contents of the tank and the downdraft tube through which the mixed liquor is circulated and in which the mechanical aeration takes place. This difference in head makes it possible to return sludge by gravity by merely connecting the sludge sump in the final settling tank to the downdraft tube. These return sludge pipes are equipped with butterfly valves for the purpose of regulating the amount of sludge return. The overflow

from the final settling tank, which is the pure effluent, is discharged directly into the Menomonee River.

Digester

The sludge digester is of the fixed-cover type with a gas holder arranged directly on the cover. The gas is used in an internal-combustion engine which drives an induction generator connected in parallel with the public service line. All the generated gas is at all times used in the gas engine, thus relieving as far as possible the amount of energy to be drawn from the public service line, which has to be paid for. The heat absorbed by the engine jacket and that remaining in the exhaust is used in a hot water circulating system which not only maintains the digester contents at optimum temperature but also furnishes heat for the service building. A coal-fired heater has also been installed to supplement the available waste heat. This auxiliary heater will be needed only during prolonged spells of very cold weather.

The digested sludge is discharged on open sludge drying beds of the conventional type. It is expected that the dried sludge can be easily disposed of, because Menomonee Falls is surrounded by small farms and truck gardens.

Personnel and Equipment

The plant was designed by Robert Cramer & Sons, consulting engineers, Milwaukee, and was built under their supervision. The funds for this work were obtained by the Village Board partly through a loan from the Public Land Commission of the state of Wisconsin and partly (about 30 per cent of the cost) through a grant of the Public Works Administration of the Federal Government. The project has provided considerable work for the otherwise unemployed of the village.

The Straightline sludge-removal mechanisms were furnished by the Link Belt Co.; the aerators by the American Well Works, Aurora, Ill.; and the gas engine generator set by the Le Roi Co., Milwaukee; the sewage-lifting pumps by the Chicago Pump Co.; and the waste sludge pump by the Chain Belt Co. The construction work was performed under a general contract by Fluor Brothers & Smith of Oshkosh, Wis.

Unusual Water Tower Cuts Insurance Rate for Waukesha Business District

By **A. P. KURANZ**
Superintendent, Board of Water Commissioners, Waukesha, Wis.

A CHANGE in the municipal fire rating from sixth to fifth class, effecting a 5 per cent reduction in insurance rates for the commercial and industrial district, followed the recent completion of a 675,750-gallon water tower at Waukesha, Wis. This reduction will equal the cost of the project in four years' time.

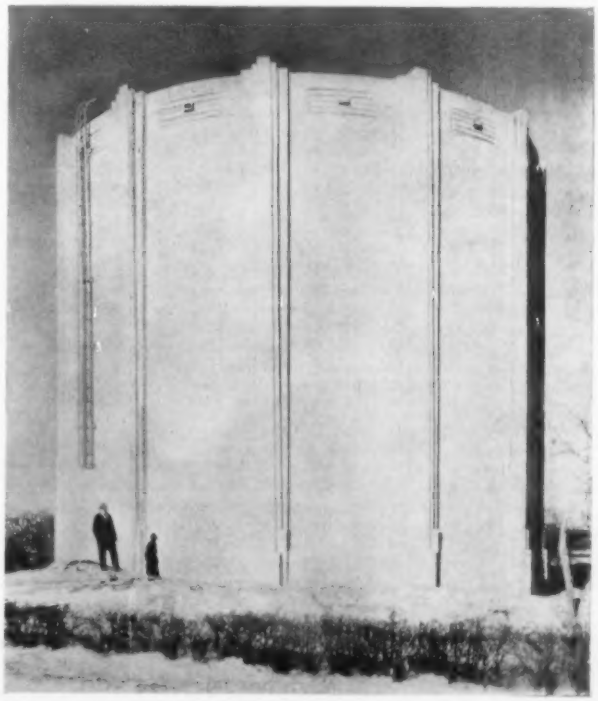
The original purpose of the tower was to bring the city's storage capacity from 321,000 up to approximately one million gallons, or enough to insure a 24-hour emergency supply. Its base is 140 feet above the pumping station.

Because of the prominent location of the tower—on a high hill in a residential area—an imposing architectural design was considered essential. Hence a monumental yet simple plan was developed as one of the first steps in undertaking the project, this plan being used as a basis for obtaining competitive bids. That insistence upon good appearance paid, is shown by the attitude of surrounding property owners. While many opposed the project at first, they now consider the tower a neighborhood asset.

Novel Construction Features

Six bidders submitted estimates on several structural designs. The contract was awarded to the lowest bidder on the William S. Hewett system of design, which embodies the use of circular steel bands to pre-stress the concrete wall, keeping the concrete always in compression. The contract was for $17,264.49, which was paid out of accrued earnings of the Water Commission.

The tank is 50 feet in diameter inside and 46 feet 1 inch high to the overflow line. The roof consists of a reinforced concrete dome, also of Hewett design, having a pre-stressed reinforcing ring. The wall is made up of a 10-inch shell reinforced vertically in both faces; turn-



THE NEW 675,750-GALLON CONCRETE WATER STORAGE TOWER AT WAUKESHA, WIS.

buckle pre-stressing bands; and a 4-inch reinforced concrete covering or outer shell.

In contrast with the horizontal construction joints usually employed in building this type of tank, all construction joints were vertical. The 10-inch shell was built in eight vertical panels, each panel being concreted in a continuous run. The outer shell was in twelve sections, with joints at the edges of pilasters.

The inside forms were built complete before concreting began. Outer forms for both shells were built up as concreting progressed; only one panel of forms was needed for completing each shell. For the outer surface, galvanized metal sheathing was used with such good results that a light sandblasting sufficed to produce an excellent finished appearance.

The concrete was carefully proportioned from available materials to give good workability and density. Gross water content was held rigidly to 5½ gallons per sack throughout. In placing concrete, three men were employed for spading, the result being a practically perfect wall free from honeycombing and leakage. The inside surface was given three thin pressure applications of emulsified asphalt, the last coat containing sand. To date, the outside wall has not a single moist spot.

This tower is one of the fruits of a general development plan started in 1931, the purpose of which was gradually to build up the water system out of operating savings resulting from previous improvements. While both supply and distribution facilities needed modernizing, it was decided to improve the supply first.

One step was to replace the nine wells totaling 1,355 gallons per minute capacity with three larger wells. The new wells have 2,930 gallons per minute capacity. Their completion resulted in material savings in pumping costs.

In 1931 a 150,000-gallon surface reservoir was added, and in 1932 a 225,000-gallon reservoir, together with pumps and pump houses for each. With the completion of the new 675,750-gallon unit the supply program is practically done. Future work will be confined to the distribution system.

The Water Department is now capitalized at $775,000; the city has invested $431,000 in bonds and appropriations, and the Department has added $344,000 out of earnings. Taxes are paid on the full capitalization. The plan is to pay the city interest on its investment, starting at 3 per cent and increasing as earnings permit, with ultimate repayment of the entire investment out of earnings. The water rates have remained the same since 1920.

The Waukesha Board of Water Commissioners is a nonpartisan body elected by the City Council. The Water Department, though publicly owned, is operated on a self-supporting basis, like a private utility.

The tank was designed and built under the personal supervision of the writer. The structural features were developed by W. S. Hewett, and the Pfeiffer Construction Co. was the contractor.

Universities Contribute Aid to Local Governments

OVER one-third of the larger cities of the United States—those with populations of 75,000 and more—are the seats of universities and colleges which are concerned with the study of the economic and governmental problems of the communities in which they are located, according to Robert M. Paige, Secretary of the Governmental Research Association. Services rendered to some of the cities are:

New York City

The Institute of Public Administration, affiliated with Columbia University, is carrying on the realistic and practical studies of governmental administrative problems undertaken originally by the New York Bureau of Municipal Research. Now under way is a survey of local government in nearby Westchester County.

New York University recently brought out, through its newly established Division of Research in Public Administration, a report on revision of New York City's charter, which is now receiving the attention of the Mayor's committee on this subject.

Chicago

The University of Chicago has issued many reports prepared by members of its Faculty and by graduate students on such pertinent topics as the government of the metropolitan area of Chicago, the water-supply problem in the Chicago region, and judicial organization in the county.

Northwestern University, located in neighboring Evanston, has also made many studies of the problems of the Chicago region, among them an important study of property taxation.

Philadelphia

The University of Pennsylvania has done much research on community problems through the Departments of Political Science, Economics and Sociology. Under way at present are studies of the direct primary in Pennsylvania, a report on government competition with private industry in the Philadelphia area, and a market survey of the state.

Detroit

Wayne University, a city-supported institution formerly called Colleges of the City of Detroit, recently established a social science research council, and in cooperation with the Detroit Bureau of Governmental Research, is developing a program of examination and investigation of the governmental problems of the Detroit area. Reports on tax delinquency and the assessment of property have already been completed.

Los Angeles

The University of Southern California has developed a more extensive training program for public employees than any other university in the country. Here city and county employees study for certificates in water, street and power engineering, police administration, office administration and general organization and management. The courses are designed to prepare public employees for advancement and also to train those who desire to enter the public service.

St. Louis

Typical of the way in which Washington University is contributing to the solution of the social and economic problems of this community is a recent report prepared by the University's School of Business and Public Administration, which analyzes 32 important indices of health, wealth and social condition by census tracts of the city.

Boston

Harvard University Faculty members have made many studies specifically focused upon either the Commonwealth of Massachusetts or cities and towns in the immediate vicinity of the University. Among these are reports on public service personnel, public utilities, the government of metropolitan Boston, and public health. As a result of a study of the public health organization of Newton, Mass., this city has reorganized its Health Department and a cooperative arrangement has been worked out whereby the Harvard School of Public Health will use the Newton Health Department as a "laboratory" for student instruction.

Boston University, via its Bureau of Business Research, has conducted a large number of research projects. Among those now under way are studies of tax assessments, trade practices, industrial trends in the state, income statistics as a basis for estimating consumer demand, and industrial changes and migrations in a typical New England city.

The list of city-located universities giving attention to governmental problems of their localities includes in addition: Western Reserve University, Cleveland, Ohio; University of Pittsburgh and Carnegie Institute of Technology, Pittsburgh; University of California at Berkeley, suburb of San Francisco; University of Minnesota, Minneapolis; University of Cincinnati, Cincinnati; University of Washington, Seattle; University of Rochester, Rochester, N. Y.; University of Louisville, Louisville, Ky.; Reed College, Portland, Ore.; University of Toledo, Ohio; University of Denver, Denver; Emory University, Atlanta, Ga.; Southern Methodist College, Dallas; Brown University, Providence; University of Syracuse, Syracuse, N. Y.; University of Dayton, Dayton, Ohio; Vanderbilt University, Nashville, Tenn.; University of Tulsa, Tulsa, Okla., and many others.

Corner Curbs Improved, Streets Widened, Sewers Extended, Under CWA and FERA

Oklahoma City's Planned Improvements Have Been Accomplished with the Property Owners' Cooperation, Reducing Unemployment

AN ambitious program of increasing curb radius at corners where it would improve traffic conditions was planned four years ago by the City Engineering Department of Oklahoma City. At that time and early in the next year seventy individual corners were improved by using the city forces. When Federal money was distributed to the states for unemployment relief, the work was continued, and then expanded, as a CWA project, beginning November 20, 1933. When CWA was altered in name to become FERA, in the summer of 1934, the work was still continued, greatly to the advantage of the city and the heavy traffic of many of its streets. To date, a total of 461 corners have been set back, including 85 in conjunction with NRM street improvement projects.

The work on the corners grew into pavement widening with relief labor. The old corner radii were from 8 to 15 feet, very good for horse and buggy days, but wholly inadequate for present motor traffic. The new standard for radii is from 20 to 50 feet as the property and underground structures will permit. The median radius has been about 30 feet.

The standard integral curb has an 8-inch face and a 2-inch batter, is 8 inches wide at the base and 6 inches wide at the top, and is carried only to the bottom of the slab, which is usually 7 inches of reinforced concrete. In some sections concrete base has been used for the sheet asphalt top in order to match the existing surface of the street. Sheet asphalt is purchased on a ton basis, in place, by a yearly contract.

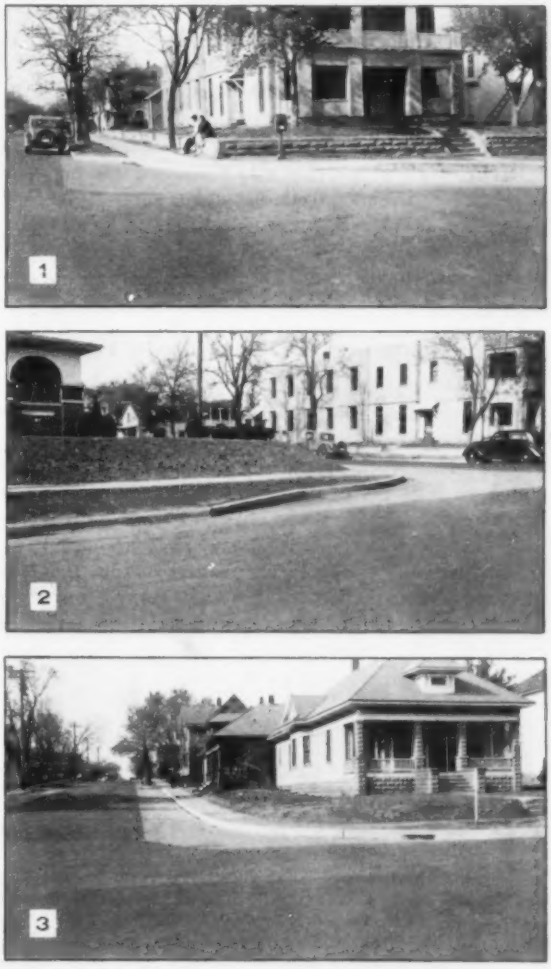
The Street-Widening Program

By state law a city in Oklahoma cannot use city money for the paving of a street or for the widening of existing streets. Thus all such work had been done by assessment in the past. Under the provisions of CWA an excellent opportunity was offered for property owners to pay for the materials needed for pavement widening and have the Federal Government pay for the labor required. The fact that the property was improved by the widening made many otherwise hesitant property owners glad to cooperate in the program. In several instances additional right-of-way was donated along narrow streets.

Initiation of Projects

Projects were almost invariably initiated by the property owners. The newspapers of the city made the start of the program front-page stories, which did much to start the ball rolling. The most common project under this program was a half-block, or about 140 feet. The widening on a side was from 7 to 15 feet, with an average of about 9 feet. The cost of materials was about $300 to the owner. Sidewalk permits, when walks were built in conjunction with pavement work, were issued gratis. With relief labor, the half-block projects required about two weeks from the time the first work started until the concrete was cured and opened to traffic.

When the program first got under way, the owner had to go to a concrete company for his ready-mixed concrete and expansion joint material, to a lumber company for the form lumber, and to a steel company for the required reinforcing. The city furnished him with a bill of materials so that he would know just what to purchase.



METHODS USED IN OKLAHOMA CITY FOR CUTTING CORNERS AND WIDENING STREETS

Photographs 1 and 2 show a curb where the radius has been increased but with no widening of the street. Photograph 3 shows, by the different color of the pavement, the extent of cutting the corner and widening the street

Later, when it was demonstrated that this might stifle the program because of the inertia of property owners in dealing with several companies, both of the ready-mixed concrete companies in the city stocked all the required materials, and each owner dealt with but one company.

The city paid for all extensions of storm drainage structures at intersections where the curb location was changed. In order to make the program as effective as possible, the city endeavored to secure the cooperation of the property owners in an entire block, but in many cases this was impossible because of finances or non-resident ownership. The City Engineering Department undertook to write to all non-resident owners asking their cooperation and calling attention to the fact that the work would cost the property owner two or three times as much when done in a few years by assessment. Another gentle but forceful silent argument for continuation of the widening for a full block was the placing of "No Parking" signs in front of all property where the street was not widened adjacent to widened sections. The argument for this procedure is perfectly logical; if it was necessary to widen the street to care for traffic, then it certainly is not right to restrict the traveled way by parking in the sections not widened.

Sanitary Sewer Extensions, a Part of the Program

About the time the pavement work started, the building of sanitary sewer extensions by relief labor was also begun. This work had always been done by assessment, and here was an excellent opportunity to place sewer lateral extensions in many alleys where the property had water but no sewer facilities, and at small cost.

Two methods of instituting projects under this part of the program were used. There were many more property owners to deal with under one project when considering sewers than with street widening, since there were from 24 to 48 lots, each 25 feet wide, in each block, and consequently from 12 to 24 possible ownerships. The sewers almost invariably run the narrow way of the lots, while most of the street widening was either the long way of the lots or in front of several narrow lots under one or two ownerships. The first method of starting the work was the commission merchant method. An individual, possibly with some financial connection with an interested material company, "promoted" a block, selling the idea and even arranging 30- to 60-day payments if necessary. When the entire block was signed up, he delivered the sewer materials to the site of the work. This method was used at several places in the city.

The other method of starting the work was for the property owners themselves to get together, representing either a whole block or a continuous section at the lower end of the flow line. They collected the money for the materials, gave it to the City Engineering Department, and received a receipt. The city opened a special "Sewer Trust Fund Account" to handle this money. At first, deposits for a complete block or separate project only were accepted. Later, however, scattered payments from a block were accepted, but in every case the money for the missing lots came through eventually. The individual payments varied from $5 to $8 per 25-foot lot. In some instances the payment which a lot owner was unable to make at the time because of financial pressure was made up by the other owners so as to insure the completion of a project which would benefit all.

Practically all laterals were 8-inch clay or concrete pipe. In the design an "n" of 0.015 was used instead of 0.013, requiring a 0.6 per cent grade instead of 0.4 per cent and insuring more satisfactory minimum velocities under conditions of low flow.

The entire curb, street-widening and sewer-extension program was carried out under the City Engineering Department, L. M. Bush, City Engineer, with plans, estimates and applications handled by Virden A. Rittger, Office Engineer. O. M. Mosier is City Manager.

Dallas Aids and Will Profit by the Texas Centennial Exposition

OF the more than $11,000,000 to be spent in preparing the grounds and erecting the buildings for the Texas Centennial Exposition which will open in Dallas June 6, 1936, the city will furnish $3,500,000, from the proceeds of bond issues voted by the people. Dallas has also given the use of 176 acres of land and buildings valued at $4,000,000. In taking this generous attitude, the city not only seeks to aid the Exposition, but also realizes that a magnificent civic center will come into its possession after the Exposition closes, on November 29, 1936.

Fair Park is a municipal recreation area of 150 acres. The city will spend $355,000 to acquire 26.5 additional acres, on which it will erect a museum of natural history, an aquarium, a horticultural museum, a museum of domestic arts, and a symphony orchestra shell and pavilion. There will be an artificial lake in the center of the tract. The entire ground is being landscaped, but the newly acquired land will become a beautiful park with informal treatment.

The Hall of State (financed by the Government of Texas and costing $1,200,000) will be the principal permanent Exposition building on the main esplanade and an impressive part of the civic center, which will include a $500,000 art museum, and the remodeled existing Fair Park auditorium.

The city will spend $180,000 on sculpture, fountains, reflecting basins and terraced pools; $241,500 on landscaping; $50,000 on decorative murals in permanent buildings; $25,000 for permanent comfort stations; $16,000 for drinking fountains; and part of the cost of a fire, police and hospital building. There are 128 separate items listed for the city to construct in addition to the art museum.

The budget of the Texas Centennial Exposition, a private corporation, calls for spending an additional $3,446,000 for construction, most of which will be on permanent buildings reverting to the city after the Exposition ends. The budget includes $976,000 for remodeling three permanent existing structures now part of the Fair Park plant.

Aside from gaining a beautiful park and civic center, the city has every reason to believe that material benefits will accrue to its residents, during the period of the Exposition and also in later years, from the throngs of visitors. The purpose of the Exposition will be not only to depict in Exposition form the historic and economic progress of Texas in the 100 years since its independence was gained, but to advertise to the nation the state's resources and its desirability as a place of residence.

The city government also made a contribution when it furnished its immediate past Mayor to the Exposition as its finance officer. Charles E. Turner, who holds the finance post, installed the same budget control system for the Exposition that was used by the former City Manager of Dallas, John N. Edy, now Assistant Director of the Budget at Washington. Both the Federal and the state governments are also contributing to the financing of the Exposition, each having made available $3,000,000.

Relief Labor Manufactures White Concrete Traffic-Line Markers

Wichita, Kans., Uses Gang Molds of Scrap Lumber

WITH only one regular city employee on the job—the foreman, engaged in running the mixer, the Engineering Department of the city of Wichita, Kans., has been able to produce a stock of several thousand concrete traffic line markers with white concrete tops for use throughout the city. Relief labor is used to cut the trenches for the insertion of the markers and to place them.

These markers have been in use in Wichita for many years with great success as regards their visibility, resistance to failure, and approval by pedestrians and motorists alike. They are used for the marking of pedestrian crossings, and also in solid lines for traffic lanes in wide streets at the center, and in broken lines for the division of the outer lanes. It is noteworthy that no ordinance in the city obliges either pedestrians or motorists to observe these traffic lines, but their very nature compels subconscious attention.

Strips Made at City Yard

The city has only recently erected a concrete shed for a garage to house all city automobiles, on a lot of land exchanged with a local traction company for a tract of made land where a channel change was constructed by relief labor. Incidentally, it is of interest that this channel change, which greatly improved the flow conditions of the Arkansas River through Wichita, gave the city a new boulevard, and also eliminated a reinforced concrete bridge. Not liking to permit anything so durable to go to waste, the city asked bids for the moving of the superstructure to a new foundation. Since the bids ran too high, the bridge was backfilled, and Wichita has the distinction of having on a main thoroughfare a bridge that no longer serves its original purpose.

As the city still has the use of garage space on leased ground, it was decided not to move the motor equipment into the new concrete shed at once, and the shed is thus available for storage and the manufacture of the traffic strips under factory conditions, protected from weather. The forms are easily assembled on heavy horses of old salvaged bridge timbers, at a good height for filling and finishing. As the floor of the building is still rough and unpaved, runways of lumber have been laid around the area devoted to the forms, so that wheelbarrows carrying the concrete can be moved readily. The accompanying plan shows the individual parts and assembly of the forms into gang molds. Scrap lumber has been used for the forms, which were made by the relief labor. The only dimensions that are adhered to exactly are those of the inside of the form for the completed strips. The remainder of the sizes depend on the lumber at hand. The molds are for five to eight strips, but most of them are for six.

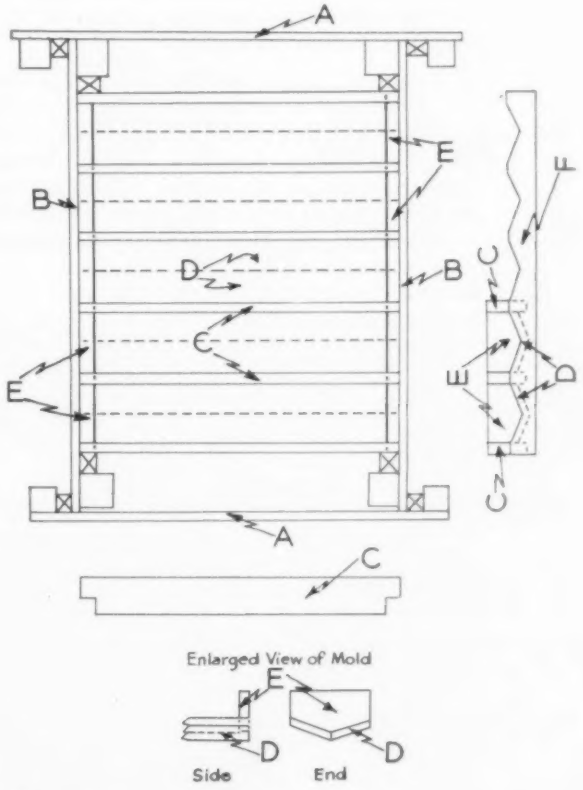
The Individual Traffic Strips

The individual strips are 30 inches long, 6 inches wide, 2 inches deep at the sides, and 3 inches at the center. This V shape makes them easier to set with a good bearing in the ground, and accounts largely for the fact that so few of them are broken in service even though they are not reinforced.

The top 1 inch of the strip is Medusa white cement and sand. The mix of the body is fine aggregate and sand, with 8 sacks of cement to the cubic yard. A ¼-inch finishing tool is used around the top to give a smooth edge. As shown in the photograph, they are set in a bed of mastic composed of sand and cutback asphalt.

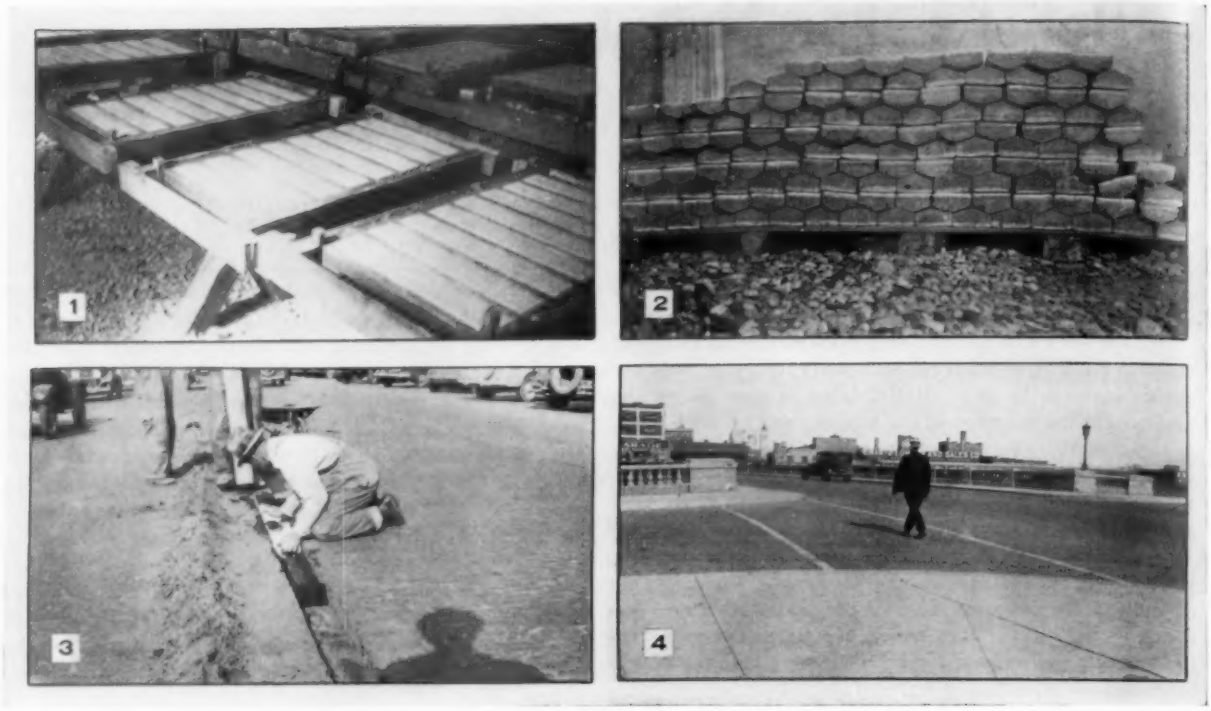
The Gang Molds

The individual molds for the strips consist of two pieces of lumber making the bottom of the mold, forming a V and nailed to end blocks to hold them firmly. These



DESIGN OF GANG MOLDS

A, end plates to hold side plates tight against end of molds; B, side plates holding ends of molds tight, and with their wedges locking the sides of the molds; C, sides of molds; D, bottom of molds; E, end block of mold; F, saddle block in which ends of individual molds rest for assembly



MANUFACTURING AND LAYING WHITE CONCRETE PRECAST TRAFFIC STRIP

1. The gang molds in a shed in the city yard. 2. Storage of winter and bad-weather production. 3. Laying the white marker in a brick street. 4. The strip in place on the new boulevard

are assembled into gangs in the saddle blocks, which hold five to seven or eight molds, each side serving two molds. The sides are notched to rest on the saddle blocks. Then the side plates are placed in position and the wedges driven to hold the molds snugly together. The final step in assembly is the placing of the end plates which hold the side plates firmly against the molds so that no concrete is spilled and no grout runs out.

After the pouring and finishing, and the curing for 24 hours in the molds, the miracle of the assembly is best demonstrated. By simply lifting the bottom of one of the end plates and at the same time giving a slight outward pull, the whole form is stripped and the molds released. The strips are removed by turning the mold over. The wood is so flexible that the concrete block drops out of the mold without any pounding.

Credit for the design of these gang molds is due P. L. Brockway, City Engineer of Wichita, under whose direction the manufacture and placing of the strips is done. Mr. Brockway gives acknowledgment for the molds to his first job on entering engineering, in the employ of a carpenter who specialized in form work. As a result of this training, his work on small jobs such as these, and also on the many large bridges he has designed for the city, has shown the adaptability of the forms in securing effective results in both simple and intricate construction.

September 12 Dead Line for PWA and WPA Applications

PRESIDENT ROOSEVELT on August 26 set up a timetable for the work relief program under which all applications for allotments must be in the hands of the Division of Applications and Information by September 12, and all contracts for construction work must be awarded and signed by December 15. Identical letters were sent to the nine Cabinet heads and the heads of eight spending agencies.

The text of the President's letter follows:

"I am writing to inform you that all applications for allocation of funds from the $4,880,000,000 appropriation under the Emergency Relief Appropriation Act of 1935, approved April 8, 1935, must be in the hands of the Division Council not later than Thursday, September 12, 1935, in such form that they can be presented to the Advisory Committee on Allotments for final action at its meeting of September 17, 1935.

"No applications for allocation of funds will be received or considered thereafter.

"It is planned that all allocations recommended by the Advisory Committee on Allotments up to and including September 17, 1935, and approved by me, will have been acted upon by the Secretary of the Treasury and by the Controller General prior to September 24, 1935.

"It is therefore directed that all governmental agencies, Federal, state, municipal, etc., be prepared on or before October 22, 1935, either to ask for bids for construction work or begin operations by direct labor (force account) on the project.

"Where projects are to be carried on under contracts, such contracts must be awarded and signed on or before December 15, 1935."

Communities which are willing and able to bear 55 per cent of the cost of PWA construction projects to win a 45 per cent outright Federal grant, and which have not yet sent their applications to the PWA director of their state, have opportunity to do so before the date mentioned.

Waste Removal and Disposal a Community Responsibility

Methods, Organization and Cost in Oak Park, Illinois

By DUDLEY C. MEYERS
Commissioner of Public Works

THE removal of the various waste materials from a community is one of the principal problems of the municipality. There was a time when garbage was disposed of by feeding it to the chickens or burying it in a far corner of the back yard; when ashes were thrown into the alley to fill in the low spots, and when rubbish and miscellaneous waste was disposed of by throwing it on the vacant lot next door or across the street. The chicken coop has been replaced with a modern garage, the ash-filled alleys have been paved with concrete and are now beautiful lanes, and there are few vacant lots.

The disposal of garbage in Oak Park, Ill., has been satisfactorily solved by the construction of a garbage incinerator where all combustible wastes are destroyed in a centrally located plant without smoke, odor or nuisance of any kind. All small dead animals, such as cats and dogs, are disposed of in this plant, which has a rated capacity of 10 tons per hour.

Garbage Collection

The garbage collection equipment and force consist of seventeen men, two 1-ton Ford trucks, three semi-trailers with 1-ton Ford tractors, and two Highway trailers, working nine hours per day. Collections of garbage are made twice a week excepting when prevented by bad weather.

The Nye incinerator is operated 13 hours per day except on Saturdays, Sundays and holidays. It is operated by five men; two of these men are on the charging floor, one in the furnace room during the day, and two work at night finishing the burning of the garbage and cleaning the furnaces, building, etc. The men working on the collection and disposal of garbage are on a five-day schedule.

Most of the leaves collected on the city streets are burned in the incinerator. In addition to the garbage and combustible waste collected by the Street Department, a considerable amount of combustible rubbish and waste material from hotels, restaurants, markets, fruit stores, etc., is delivered to the incinerator.

The combustible refuse collected by the village teams and brought in by the stores, etc., furnishes practically all the fuel required to burn the garbage. When the garbage is very wet, or when the amount of combustible materials collected is not large, it has been necessary to burn some coal.

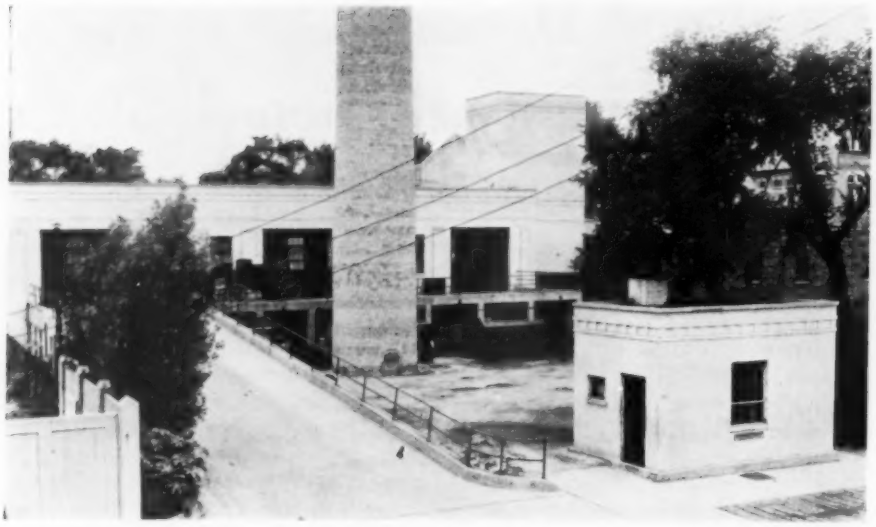
Costs and Quantities

The following tables give a recapitulation of the quantities and costs of collection and disposal:

GARBAGE DISPOSAL

Collected by village teams and trucks (including 1,594 cats, dogs, etc.), garbage and combustible wastes.....	10,285.0 tons
Brought to crematory by grocers, market men, etc.....	1,709.4 tons
	11,994.4 tons

A 1½-TON HIGHWAY SEMI-TRAILER IN A LANE IN OAK PARK LOADED WITH 3,500 POUNDS OF WRAPPED GARBAGE AND COMBUSTIBLE WASTE TO BE HAULED TO THE INCINERATOR



ENTRANCE AND EXIT RAMP OF THE OAK PARK, ILL., MUNICIPAL INCINERATOR

Average amount burned per day, 46.49 tons (258 days)

Total loads of garbage and combustible waste	9,647
Total loads of market refuse	5,351
	14,998 loads

Crematory ashes disposed of: 1,958 cu. yds, or 1,090¼ tons (299 loads) to dump at Maywood

Collection		Disposal	
Labor	$23,481.99	Coal (228 tons)	$1,385.55
Teams and trucks	3,499.69	Labor	7,322.50
Supplies and repairs	27.96	Teams and trucks	197.35
Superintendence	1,869.06	Supplies and repairs	942.60
	$28,878.70	Superintendence	586.70
		Light and power	695.62
			$11,130.32

Cost per ton, $2,808 $0.928

Total cost of collection and disposal of all garbage and combustible waste, $40,009.02

Incombustible Wastes—Collection and Disposal

Ashes, tin cans and other miscellaneous incombustible household waste are collected together about once a week. The disposal of this incombustible waste has not yet been satisfactorily settled. For many years these materials were dumped on low lands in the northwest end of the village. This land is now being improved as a park. Later on, these wastes were disposed of by dumping on low lands west of the Des Plaines River, and still later at a quarry in Cicero, Ill., and at the Industrial Refuse Disposal quarry near Summit, Ill.

The expense in connection with the last two locations was considerable, for a charge was made for each load dumped. During 1934, all materials were dumped on leased ground on low land on the west side of the Des Plaines River. A two-year lease was secured on January 1, 1934, and already a very considerable amount of the space available has been filled and it will not be long before the village will again have to consider some other place or means of disposal of incombustible waste and rubbish. This ground has an area of approximately 2 acres with a fill of 18 feet and is rented for $175 a month. It was necessary during 1934 to throw up an embankment of earth along the Des Plaines River in order to keep the materials dumped on the low land from being washed into the river at flood-stage.

All garbage and other waste collections are made by the Street Department.

In the portions of the village where there are no alleys, the ashes, tin cans and miscellaneous waste are set out at the curb and removed by the Street Department on Tuesdays in one section and on Fridays in the other section.

The following table shows the cost and quantities:

Labor	$30,866.97
Teams	3,001.66
Trucks	2,755.65
Hired teams	2,478.33
Supplies and repairs	582.20
Superintendence	2,466.65
	$42,151.46

Amount collected, 52,286 cu. yds., or 7,895 loads
Cost per cu. yd., $0.8061

Water Resources Committee Organized

THE Chairman of the National Resources Committee, Harold L. Ickes, announced on July 30 the organization of a Water Resources Committee:

Abel Wolman, Chairman of the American Water Works Association and Chairman of the Maryland State Planning Board
Thorndike Saville, of the American Society of Civil Engineers, and Associate Dean of the College of Engineering, New York University
N. C. Grover, Chief Hydraulic Engineer, Water Resources Branch, U. S. Geological Survey, and
Elwood Mead, Director, Bureau of Reclamation, Dept. of the Interior
Jay N. Darling, Chief, Biological Survey, and
H. H. Bennett, Chief, Soil Conservation Service, Dept. of Agriculture
R. E. Tarbett, Sanitary Engineer, Public Health Service
Major General Edw. M. Markham, Chief, U. S. A. Engineers
Thos. R. Tate, Director, Nat'l Power Survey, Fed. Power Commission
H. H. Barrows, Professor of Geography, University of Chicago, formerly member of the Mississippi Valley Committee and the Water Planning Committee of the National Resources Committee
Edward Hyatt, State Engineer of California

The former Water Planning Committee and the consultants working with the National Resources Committee have been retained in an advisory capacity for the work of the new committee. Brent S. Drane has been appointed Secretary to the new committee; he and Gilbert White will serve as members of the regular staff of the National Resources Committee under its Executive Officer, Charles W. Eliot, 2d.

At the first meeting of the Committee various water projects now pending before the Works Progress Administration were discussed both in connection with construction proposals and for collection of basic data. The Committee is engaged in outlining a long-range plan for the more effective use of all the water resources of the nation and for continuance and application of the policies set forth in the report of the Mississippi Valley Committee and the December, 1934, Report of the National Resources Committee.

Construction and Maintenance Methods for Traffic-bound Roads

By **H. G. SOURS**
County Engineer, Summit County, Akron, Ohio

IT is possible to utilize bank-run gravel in traffic-bound roads and to secure good results with it where a few years ago many of these banks were not considered suitable for surfacing material. The fact that the deposit in the bank may have clay and fines present is desirable rather than detrimental. The fact that one bank may be graded differently from another is of no serious consequence, because by the introduction of some of the deficient sizes and the proper amount of clay the finished product can be brought within satisfactory limits. The larger-sized gravel should be removed. It is not particularly detrimental to the road, as far as construction is concerned, but it does cause difficulty in maintenance.

The clay in the subgrade may be used if it is suitable, thereby avoiding the necessity of hauling it in. If not suitable, it is usually profitable to search for a clay which has a high cohesive value or plasticity index. By testing various samples these properties can be readily determined. It is usually more economical to haul a highly cohesive clay a greater distance if necessary, because of the lesser quantity required. All clay-soil banks contain fines other than pure clay, but it is the pure clay content which we need. The most desirable clay soils are those which coming from the bank do not have more than 50 per cent silt.

A Few Definitions

The stabilized road might well and simply be defined as one made up of a graded combination of fine and coarse aggregates proportioned so as to permit the minimum amount of displacement of the component particles after once in place, cemented together with the proper amount of clay which acts as a binding agent. The resistance of the coarse and fine particles to sliding over each other is known as internal friction; sharp, angular and to some extent flat materials have a higher factor of internal friction than round, and will make a more stable mix.

The resistance of the soil particles to being pulled apart is known as cohesion; this might simply be referred to as the stickiness of the clay.

The plastic index of a material often referred to in papers on stabilization work is a measure of its range of moisture absorption within its dry to wet limits of plasticity; it is a measure of the cohesive properties of the soil fines.

Methods of Construction

There are several methods of construction which are being used successfully. Where the work is being done on a new grade rather than stabilizing an existing road, the mixing can best be done by first depositing the gravel or coarse aggregate in a windrow on one shoulder, and the clay on the opposite shoulder. If the clay in the subgrade is suitable, it may be scarified and bladed onto the shoulder; if not, it must be hauled from a suitable deposit. The clay should be pulverized if it is lumpy; this may be done by blading or rolling. The desirable condition is to have dry weather when the mixing is being done, and some rains when the mixed material is being laid down and compacted. The windrows should then be brought from the shoulders and spread over the road in alternating layers of coarse material and clay. This distributes the material uniformly and makes the actual mixing more effective.

The mixing itself may be done in several ways. It may be done by continuing to blade back and forth with a blade grader and tractor. It may also be done by means of a multiple-blade drag. Some have used an ordinary harrow. The harrow must be used by doing the job in layers, since the teeth would not effectively mix the entire depth. The heavy road disc harrow is one of the most effective and economical pieces of equipment used for mixing. The discs can be set at any desired angle and are capable of cutting through the entire depth of material, so that it is not necessary to mix in layers when using this method. The action of the discs is such that it completely turns over all the material and does a good job of mixing.

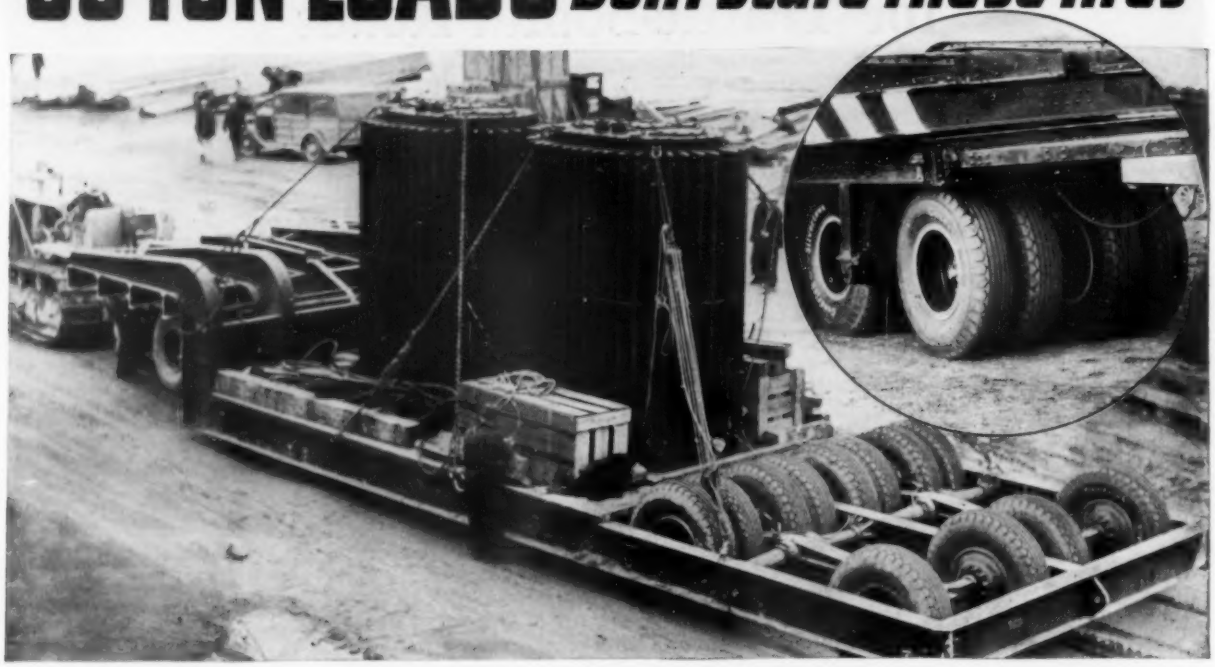
Importance of Moisture

After the mixing has been completed, the material should be bladed off on the shoulders in windrows. If the weather is extremely dry or wet, the material should be left there and not laid down until it has the proper amount of moisture to compact well. If there is a prolonged dry season, the water can be supplied with sprinkling tanks. Best results can be obtained by laying the material down, leveling and compacting in approximately 3-inch layers. Where it is available, a tamping roller will produce better results than the ordinary road roller.

The Use of Calcium Chloride

The thing which is necessary to keep a stabilized road in good condition is to have at all times a sufficient amount of moisture in the material to keep it in a compact, dense and, to a large extent, impervious condition. Dry material, whether it is clay, silt or sand, will dust off under traffic in dry weather unless kept damp. On the other hand, clay alone, or too much clay in a mixture with coarse material, will become plastic in wet weather. Consequently, it is necessary to supply the moisture by artificial means in dry weather, and it is likewise important that there shall not be too much clay present in the mixture so as to cause trouble in wet weather.

80-TON LOADS *Don't Scare These Tires*



NEW TYPE TRUCK TIRES USED ON GIANT 20-WHEEL TRAILER AT GRAND COULEE DAM

They had a tough transportation problem at Grand Coulee Dam. Heavy equipment and materials had to be hauled 30 miles or more over rough roads to the site of the dam. It takes a crawler tractor to supply the power!

So the contractor built what is believed to be the world's largest trailer. Built for loads up to 60 tons. The trailer itself weighs 20 tons.

To carry this gigantic load they use the new Triple Protected Silvertowns—the tires that have proved themselves on the hardest hauling jobs in the country!

These new truck tires have a revolutionary invention incorporated in the sidewall. The invention actually checks 80% of premature failures. It means that tires stand up longer under the battering, bruising punishment of construction work.

Tires that carry 80-ton loads at Grand Coulee will handle *your* job right, too!

One tire failure on an important job may cost you hours of delay—men and equipment idle—a big repair bill. Why not play safe? Get the tire that's just as strong in the sidewall as it is under the tread! Here's how triple protection works:

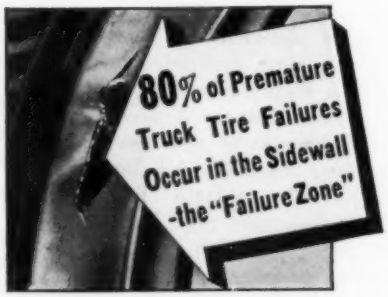
1 **PLYFLEX**—a *new*, tough, sturdy rubber material with greater resistance to stretch. A layer of Plyflex in the sidewall prevents ply separation—distributes stresses—checks local weakness.

2 **PLY-LOCK**—the new Goodrich way of *locking* the plies about the bead. Anchoring them in place. Positive protection against the short plies tearing loose above the bead.

3 **100% FULL-FLOATING CORD**—Each cord is surrounded by rubber. With ordinary cross-woven fabric, when the cords touch each other, they rub—get hot—break. In Silvertowns, there are no cross cords. No friction.

FREE! 44-PAGE HANDBOOK FOR TRUCK OPERATORS

Every truck owner, every driver should have this big 44-page handbook. Gives commodity weights, tire load capacities, inflation schedules, dual spacing chart, load analysis and other useful information. No obligation. Write for free copy. Dept. T-107, The B. F. Goodrich Company, Akron, Ohio.



Goodrich *Triple Protected* **Silvertowns**

SPECIFY THESE NEW SILVERTOWN TIRES FOR TRUCKS AND BUSES

Calcium chloride is used to supply the required moisture. There are two methods of using it—the integral mix, and surface application. For the integral mix, it should be applied to the top layer of mixed material, not to exceed 3 inches in depth and 2 pounds of calcium chloride per square yard; then calcium chloride should be spread over the loose top layer of mixed road material, not to exceed 1½ pounds per square yard. The chloride is thoroughly mixed with the top layer of material and then spread, leveled and compacted. The surface should be maintained by blading and dragging for a few days until it is rather firmly compacted. Then a ½-pound per square yard surface application of calcium chloride is made.

If the surface application method is used, the shaping and compacting of the top layer should be completed and the calcium chloride then spread on the surface at the rate of 1 to 1½ pounds per square yard. The surface method will produce best results if applied late in the day or after rains. After the application of calcium chloride is completed, the road should be kept under maintenance for several days by blading and dragging until compacted firm and smooth. The conditions will govern the amount of maintenance and type of equipment to use.

Proper Crown Essential

Too much attention cannot be paid to working-in the proper crown on the completed surface. This should be approximately ½-inch to the foot. A flat crown will permit pools of water to lie on the surface after rains and will soon result in a surface full of pot-holes. The water must be taken off the surface quickly if the road is to be kept smooth and intact. This matter of crown is one of the most important items in stabilized construction.

Treatment of Existing Road

Where it is planned to stabilize an existing traffic-bound road, the materials in the existing surface should be sampled and tested. The proper amount of clay required may then be hauled and spread either down the middle or on one side of the road, and pulverized by any of the various methods. It should be bladed to one shoulder and the old base scarified. If it is intended to use some new material with the old, it should be hauled in place and the old and new then bladed off. The mixing and finishing can be done in practically the same manner as has been described for new construction.

Wet Weather Hazards

If wet weather is encountered soon after completion of the work, there may be a tendency toward either a slippery or a sticky surface because there may be some clay on the surface which has not thoroughly compacted. Under ordinary weather conditions some of this will wear off and leave a hard surface. If it becomes slippery at first, it may be necessary to put on a light application of some kind of gritty cover material.

Specialized Maintenance

One of the most important questions in connection with stabilized road work is to know what to do with the roads after they have been built. No loose or floating material should be carried on the surface during dry weather. This acts as an abrasive material and tends under traffic to create raveling. Blading should be done only after rains sufficient to make the surface workable. Any attempt to blade while dry tends to loosen the top material; it also wastes the calcium chloride which has been drawn to the ruface by capillary during a period of dry weather.

During wet weather a small amount of loose aggregate may be bladed-in and spread over the surface; this material will bind-in and help to fill any small depressions. A small amount of the shoulder soil, if of a satisfactory quality, will help to bind the loose material when bladed over the surface. If the shoulder soil is not satisfactory as a binder, a small quantity of clay may be spread along the shoulder and held available for use at the proper time. When the surface again becomes dry, the excess loose material should be removed by lightly blading off onto the shoulders. A combination of the cutting and building-up methods may often be used to advantage.

There may be times during a continued dry period when it will be found necessary to patch some holes in the surface. Patching of a series of very slight depressions is not considered advisable, but the deeper holes should be filled. A mixture of approximately 50 per cent graded gravel under ½-inch in size and 50 per cent sand-clay, together with from 100 to 150 pounds of calcium chloride per cubic yard, will make a good patching material.

Moisture retention of a stabilized road mix is necessary to retain stability and prevent raveling. This is accomplished by periodic applications of calcium chloride. About 2 pounds per square yard per year are required. The best results are obtained by applying 1 pound per square yard in the spring when the road metal is still moist. This can be followed by one or two applications of ½-pound per square yard each; conditions will govern the need of re-treatments. In general, less calcium chloride is needed after the first two years.

Conclusion

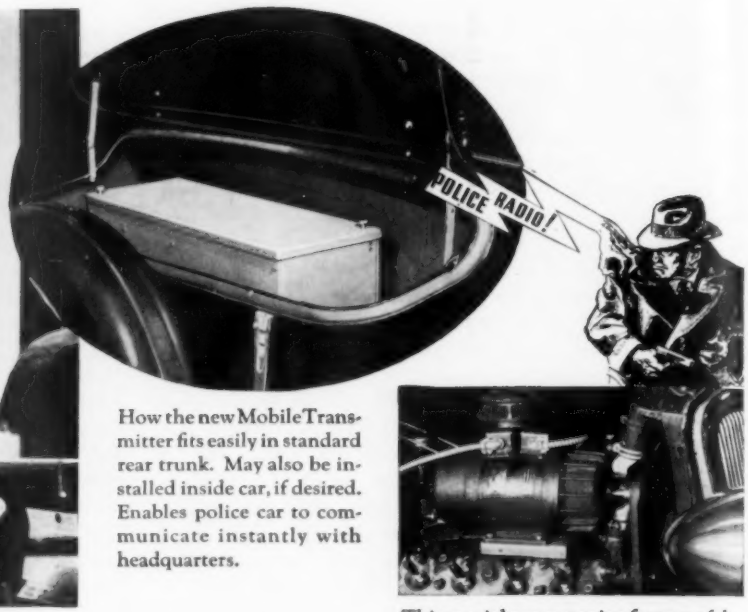
The stabilized road properly constructed fits conveniently into the low-cost construction field and is well adapted to the use of local materials. Proper construction and a knowledge of maintenance are essential to secure satisfactory results. The application of theory and laboratory control must be done in a practical manner so as to obtain good results without unreasonable costs to secure unnecessary refinement.

—From a paper presented before the American Road Builders' Association.

Better Exchange Between Los Angeles and Southern California Edison

THE largest frequency converter ever to be built has been ordered from the Westinghouse Electric & Manufacturing Co. by the Los Angeles Bureau of Power and Light, for interchanging power with the Southern California Edison Co. It will be located at Wilmington, Calif., with the 50-cycle end connected directly to a 50,000-kw turbine, assigned to the city for standby, in the Long Beach plant of the Southern, four miles distant. Capacity of the converter is 60,000 kva, weight 600 tons. It will be enclosed for outdoor service and will rotate in hydrogen gas, to reduce both heat and windage losses. Eventually all Southern California will operate on 50 cycles, when the two units now composing the frequency changer will be divided for use as synchronous condensers to control voltage on the system and on the receiving end of the Boulder Dam transmission line.

Chief C. A. Peterson, Department of Police, Englewood, N. J., at the microphone of his RCA Terra-Wave Police Radio Transmitter.



How the new Mobile Transmitter fits easily in standard rear trunk. May also be installed inside car, if desired. Enables police car to communicate instantly with headquarters.

This special generator is a feature of the ET-5022 Mobile Transmitter. It avoids heavy drains upon the car's battery, assures perfect operation at all times.

RCA Terra-Wave Police Radio

giving Crime its death-blow!

In cities throughout the United States, criminals are often captured in this manner:

3:40 p.m. Hold-up men enter store and steal cash.

3:43 p.m. Proprietor telephones police, giving description of men and of car in which they escaped.

3:44 p.m. Descriptions of men and car are broadcast to all police cars through RCA Terra-Wave Transmitter at Headquarters.

3:45 p.m. Police car arrives at store to control crowd, seek for fingerprints and other traces of robbers.

3:47 p.m. Another police car sights escaping bandits and reports to headquarters by radio, giving direction in which they were fleeing.

3:47:30 p.m. Headquarters broadcasts again, instructing two police cars to proceed to crossroads toward which criminals were driving and intercept them.

3:49 p.m. Fleeing car is trapped at crossroads and hold-up men surrender. Time from commission of crime, 9 minutes.

RADIO and radio alone gives such results, makes the police so efficient. In city after city it is reported that this system catches more criminals and reduces crime by making capture more certain than ever before.

RCA Terra-Wave Police Radio is a complete system, including not only headquarters transmitter and mobile receivers, but also mobile transmitters. It thus offers 2-way communication between the dispatcher and the car. The equipment is compact, low in price, and exceedingly economical to operate. The ability to put officers at the scene within a minute or so greatly enhances the reputation of the department. Write for complete details.

Sales and Service Representatives in Principal Cities

RCA TERRA-WAVE POLICE RADIO SYSTEM

RCA MANUFACTURING COMPANY, INC.—CAMDEN, NEW JERSEY

A Radio Corporation of America Subsidiary

Municipal Housekeeping in Baltimore

The Bureau of Street Cleaning Removes Household Wastes as Well as Cleaning the City's Streets

THE city of Baltimore has a population of 816,000 and a land area of 94 square miles. In this area are 170,400 homes, about 1,000 miles of paved streets, and 400 miles of improved alleys. One of the greatest responsibilities of our city government is to see that the most healthful and sanitary conditions prevail at all times within the city. This it does by supplying pure water, by building, extending, and maintaining a modern sewerage system, and providing a Health Department which in addition to looking after the health of the citizens from a medical standpoint, supervises all the sanitary inspections relative to foodstuffs, such as milk, seafood, and produce, as well as the plumbing and sewerage installations.

In addition, there is the Bureau of Street Cleaning, whose duties are the cleaning of all streets, alleys, and markets, as well as the collection and removal of all household wastes, such as garbage, ashes, rubbish, and all other materials, including dead animals, which through the process of decay would become unsanitary and a detriment to public health. All horse-drawn equipment has been eliminated from the Bureau, which is now completely motorized. The latest and most modern covered garbage equipment is now in use on this collection service, and a number of small closed trucks have been acquired for street-cleaning work and the scavenger service.

The work of the Bureau is divided into three operations, known as the Street Cleaning Division, Sanitary Division, and Miscellaneous Operations. The following detailed information is given on each phase of the work.

Street Cleaning Division

This class of work covers the cleaning of streets, alleys, and markets throughout the city. All this work is done by the labor forces of the Bureau, requiring 350 men daily.

The city is divided into nine street cleaning districts, each having a district foreman who supervises actual operations in the field. Each district has a small gang of men who clean the rough paved streets and paved alleys, giving this service one day each week over the whole district. The rest of the laborers are divided into squads of four men each; two of these men sweep the streets and pile the débris, and the other two push along small hokey-pokey carts and pick up the material piled, placing it in small cans. These groups are known as smooth-pavement squads. Each squad has two distinct routes which they cover on alternating days.

When the hokey-pokey cans are filled, they are placed at various locations on the route and emptied into trucks, which are assigned daily for the collection of this waste and haul the material to various dumps in the immediate vicinity of collections. This work is all in residential sections and has proved adequate. The business district of the city is cleaned each night of the week, except Sunday.

In addition to the hand work, the Bureau has five Hvass flushers, each mounted on a 3-ton truck chassis. These machines flush the streets of the business district each night, weather permitting, and the same machines flush all the streets in the city, during the daytime, once every ten days, except during extreme cold weather or the rainy periods of the year.

Market Cleaning

The markets of the city are cleaned by the forces of the Street Cleaning Division. Each market is thoroughly washed and cleaned after the regular market hours are over, on the regular market day, as specified by ordinance. Every Saturday night and on the eve of all important holidays, the above service is repeated. The rest of the week all rubbish and garbage is removed daily, so that waste materials do not accumulate and cause obnoxious odors. As there are thirteen markets in the city, some having different market days from others, this work is under way daily.

Sanitary Division

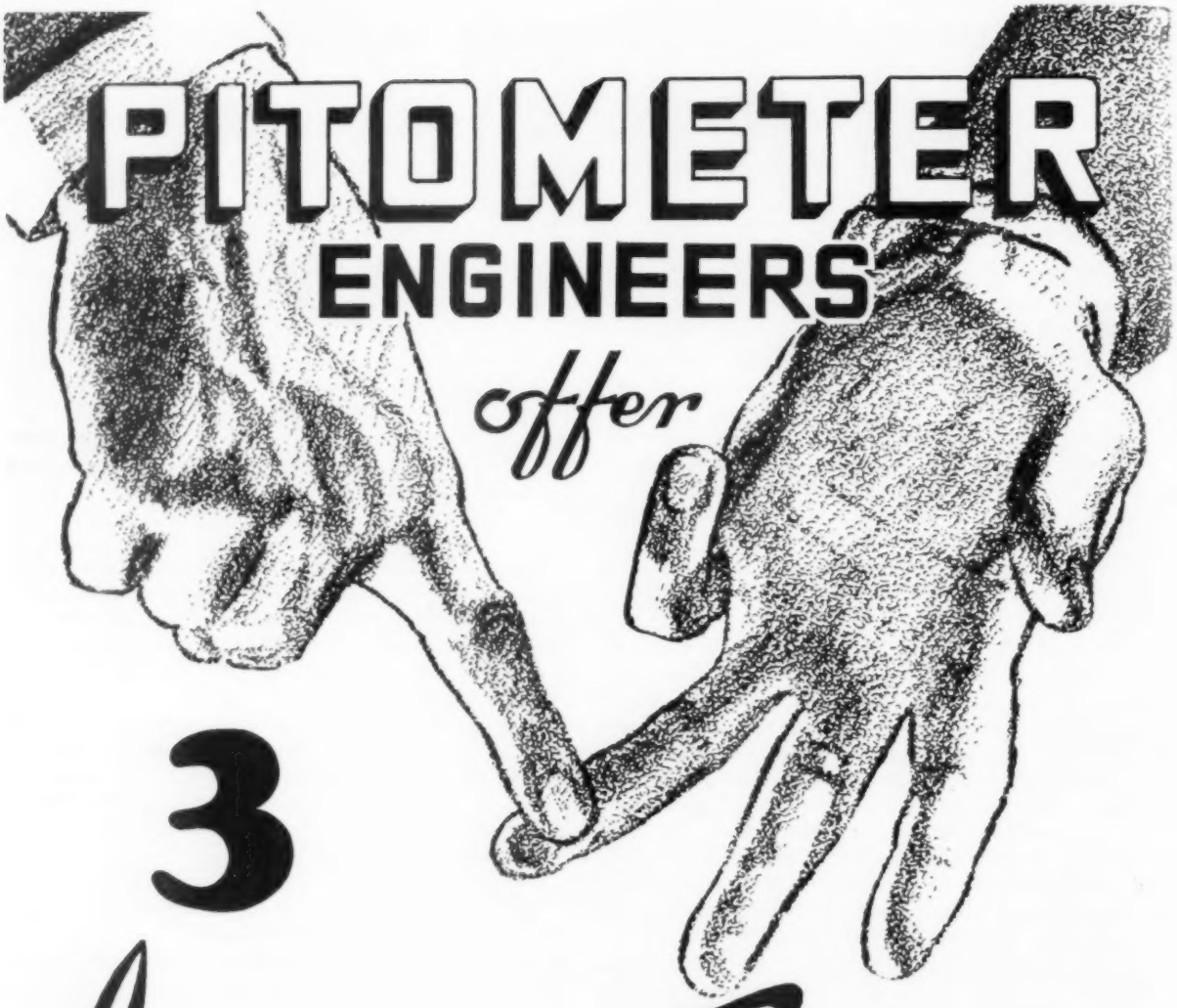
This Division collects all the household waste materials. Garbage and ashes are collected by the labor forces of this Bureau. Rubbish, which is composed of all household refuse and wastes, except garbage, ashes, and building materials, is collected under contract by The Foreman Co.

Garbage is collected three times weekly during the summer months and twice weekly during the winter, from each householder. It is necessary to give a daily service to hotels and restaurants in the vicinity of the Pennsylvania Railroad station as well as a service each night to all hotels and restaurants in the business district. One hundred and twenty-five men are employed on garbage collection during the winter months, and 200 men during the summer, at which time these materials are the heaviest and the total quantity collected reaches its peak.

The city operates motor trucks of 4.6-cubic-yard capacity, of the latest covered sanitary type and design, on these garbage collections. Each truck has two separate routes which are covered three times weekly in summer, and three separate routes which are covered twice weekly during the winter months, thereby insuring a uniform delivery of garbage, each day, to the incinerator for disposal. All garbage is disposed of by high temperature incineration, the reduction method having been discontinued December 31, 1932.

The city is divided into seven sanitary districts, each having a district foreman in charge of actual operations.

Ash collection is done by the labor forces of the Bureau and is entirely motorized. During the winter months,



PITOMETER ENGINEERS *offer*

3 *Important Services*

One *Water Waste Surveys* locate hidden leaks and other sources of water waste, accounting for all the water that enters the distribution system. See Pitometer Bulletin No. 17.

Two *Trunk Main Surveys* ascertain which mains are overtaxed with resultant loss of pressure, and which mains are not doing all the work for which they were designed. See Pitometer Bulletin No. 18.

Three *Distribution System Studies* determine necessary extensions and replacements to meet present needs and future requirements over a twenty-five-year period. See Bulletin No. 18.

We welcome the opportunity of showing you what we have done for others and what we can do for you.

THE PITOMETER COMPANY

Water Distribution Engineers

52 CHURCH ST. NEW YORK, N. Y.

During September we hope you will remember to mention THE AMERICAN CITY

two days' collection weekly is given to each residence in the city. In the summer months, when this material is very light, just a few trucks are used. These trucks give one day's service weekly over the entire city.

A city ordinance places the maximum amount of ashes that can be collected from any one place, in any one week, at 15 bushels. This relieves the city from collecting all ash made from industrial and manufacturing plants.

This Bureau collects approximately 190,000 tons of ashes each year, which is hauled and disposed of on dumps, marsh lands, and in abandoned quarry holes in various sections of the city.

Rubbish is collected under contract by The Foreman Co. Each resident receives one collection service weekly. The material placed in the waste paper cans, located in front of schools and on the streets, is also collected by The Foreman Co.

These materials are hauled and disposed of by incineration either at the No. 2 incinerator, city-owned, at Philadelphia Road and North Point Road, or the No. 3 incinerator, operated by The Foreman Co., at Reed Bird Avenue and Hanover Street. In wet weather, or if either incinerator breaks down, these materials are hauled to Caroline Street and disposed of by scows.

Under the old system, rubbish was allowed to accumulate and was cleaned out at stated periods, usually in spring and fall. This contract has proved very satisfactory, for it eliminates the fire hazards that previously existed owing to the accumulation of materials as well as improving general sanitary conditions throughout the city.

Miscellaneous Operations

Included under this head are the following: scavenger service; collection of small dead animals under two hundred pounds; collection of large dead animals over two hundred pounds; collection of waste oil and greases; mosquito extermination; and removal of snow.

Scavenger Service.—Collection of small dead animals under 200 pounds is done daily by the Bureau. The work is heaviest during the summer months, requiring two covered trucks, which are of the latest type and design. During the rest of the year, one truck only is required. The animals are disposed of at a fertilizer plant in the city, without charge. Approximately 30,000 are collected each year.

For the collection of large dead animals over 200 pounds, the city has a contract, without bond, with a fertilizer company. The contract is without expense to the city since the fertilizer company pays the Bureau of Street Cleaning $1 for each animal reported to it.

Collection of Waste Oils and Greases.—The city has a contract which covers a three-year period, at a stipulated sum, for the collection of waste oil and greases from the various garages throughout the city. In former years these materials were stored on the premises of the various garages or dumped in the sewers. This created a fire hazard on the premises and caused quite a number of fires due to the explosion of this material in the sewer system.

The contract has proved highly satisfactory, for it has eliminated this unsatisfactory condition. All materials are moved promptly by the contractor, upon proper notification, either to the Bureau of Street Cleaning or to the contractor direct.

Mosquito Extermination.—A force of men is assigned to mosquito extermination early in May of each year, and they continue work through the summer months into September. They are engaged in draining swamp lands, opening ditches and spraying oil in an effort to eliminate the breeding places of the mosquito. Good results are obtained from a health standpoint, with a minimum of complaint.

Snow Removal.—The Bureau of Street Cleaning is responsible for the removal of snow from the business district. The markets must be cleared of snow as early as possible after the snow stops falling. In addition, snow is removed upon request from in front of all churches as well as private homes where funerals are to take place.

After this work is completed, the boulevards and main thoroughfares are cleared; then all alleys are given service. During this entire period, the collection service of garbage, ashes, and rubbish is carried on.

The work of the Bureau could be expedited if the householders would discontinue the practice of clearing their yards of snow and piling it in the alleys, blocking them, and then, instead of throwing their ashes in the alleys on the snow, put them on the front for collection. Residents who are guilty of this misdemeanor are violating the law of the city as well as retarding the speed of the forces of the Bureau in getting back on regular schedule with all the various services which it is required to render.

Purdue University to Develop a New Community

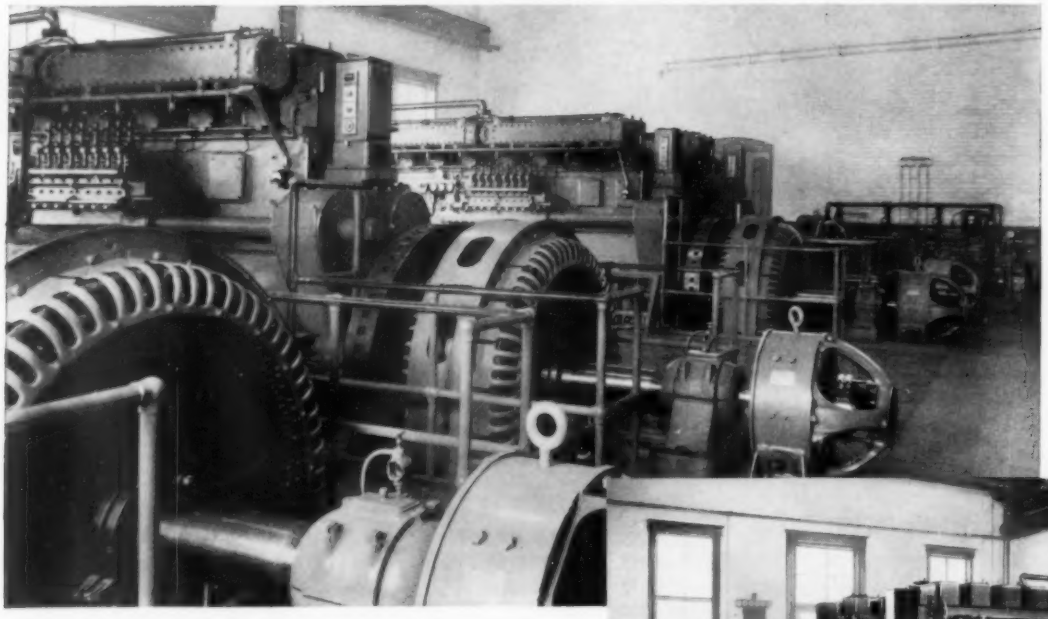
UPON a site of 145 acres given to the Purdue Research Foundation by David E. Ross, President of the Board of Trustees of Purdue University, the Foundation proposes to develop a new community—a group of homes to be occupied by members of the scientific staff of the University, who will pay a minimum rental approximating actual amortization, taxes, carrying charges, and other similar basic costs. In this cross-section of average American housing, life will be adjusted as perfectly as possible to conditions as they exist today, discarding tradition and custom wherever these have outlived their value. In working toward an ideal of more perfect modern living conditions, it is contemplated to present a practical demonstration of a variety of the most modern and efficient materials, equipment, and methods of construction available in the building world. There is only one restriction: each house built must make some definite contribution to superior housing, for the object invariably will be to *improve* in economy or value, and never at any sacrifice to living accommodations.

The thought will be not only in terms of every part of the fundamental construction, but equally in heating, lighting, ventilation, air-conditioning, laundry and kitchen facilities; and besides economies in construction and maintenance costs, economy in reduction of depreciation, fire hazards, repairs, earthquake, storm, termite damage, deterioration, and settling.

The declaration of this undertaking and its purpose was made by Dr. Edward C. Elliott, President of the Purdue Research Foundation, at the Homes Conference held by the Foundation on June 1, 1935. The Proceedings of the Conference are published in the 56-page Bulletin No. 6 of the Foundation (West Lafayette, Ind.), of which G. Stanley Meikle is Research Director.

CANADA'S LARGEST

Municipal Diesel-Electric Plant Selects Engines of McINTOSH & SEYMOUR DESIGN



Engines, 8 cyl, 600 bhp, 300 rpm, direct connected, designed by McIntosh & Seymour Corporation. Built by Montreal Locomotive Works, Ltd. Owned by City of St. Hyacinthe, Que. Application, Water Pumping and Street Lighting.

AFTER St. Hyacinthe City, Quebec, had investigated the performance records of many plants in England, Germany and the U. S. A., they reached the definite conclusion that Diesel engines would prove the most satisfactory prime movers for their new municipally owned power and light plant.

Following the submission of bids for Diesels by twenty manufacturers, the contract, which specified engines of McIntosh & Seymour design, was awarded to Montreal Locomotive Works, Ltd. These four engines, adhering to every detail of McIntosh & Seymour design, were Canadian manufactured except for a few parts supplied by the designers.

After nine months of operation Jean Bouchard, City Engineer, makes this significant report—"The four engines are operating very satisfactorily . . . by concentrating our water filtration and street lighting in one plant, material economies have already resulted."

This signal recognition of McIntosh & Seymour Diesel design and performance, Canada's largest installation of its kind, is typical of the preference accorded to these engines for municipal, marine and many industrial uses. Ask for more "Economy Diesel" facts.

M-S Diesel Engines comprise 35 standard units, ranging from 120 to 1600 hp with 3 to 8 cyls, with rpm and drive suited to every requirement

McINTOSH & SEYMOUR CORPORATION

(DIVISION OF AMERICAN LOCOMOTIVE COMPANY)

MAIN OFFICE AND WORKS, AUBURN, N. Y.

NEW YORK, N. Y., 30 Church St. BOSTON, MASS., 20 Newbury St. CHICAGO, ILL., McCormick Bldg. WASHINGTON, D. C., Barr Bldg.
HOUSTON, TEXAS, Esperson Bldg. KANSAS CITY, MO., Commerce Trust Bldg. SAN FRANCISCO, CAL., Bourn Bldg.

The President's Home Town Improves Its Water Supply

By JAMES C. HARDING

Consulting Engineer, New York City

THE town of Hyde Park, New York, is situated amidst beautiful rolling country on the east bank of the Hudson River some six miles north of Poughkeepsie. The more thickly built-up area, located along the Albany Post Road and having a population of about 1,200, is included within the boundaries of the Hyde Park Fire Department. The community is almost entirely residential in character. The Fire Department was created by act of Legislature in 1860. It is governed by five trustees elected annually. These trustees not only have charge of the Fire Department, but also supervise the water system. The Fire Department collects its own taxes and does such a good job that uncollected 1934 taxes in October of that same year totaled less than $30.

Community Water Supply Provided

After the Fire Department was created, steps were taken to provide fire protection for the community. Cisterns were dug at central locations and roof leaders from nearby houses were connected to them. When the cisterns could not be filled by roof water, water was hauled up by wagon from the Hudson River.

In 1901 the inhabitants felt that their community was large enough to have a piped water system. Accordingly mains were laid in the more important streets, a pumping station housing a 100-g.p.m. triplex pump, an 8-foot vertical pressure filter and accessories was constructed to take water out of Crum Elbow Creek and a 75,000-gallon tower tank was erected near the pumping station.

The original water supply system with a very few improvements served the community until 1934, when its shortcomings made the people feel that it should be improved. There was only one pump available and when this got out of order it was necessary to take one of the fire engines to the pumping station and pump directly into the mains through fire hose. The pump suction line consisted of a length of rubber hose sticking out from one side of the building and dropping into the creek. This froze up several times. A further fault with the supply system was that it did not provide sufficient water for fire protection.

The New Water Works

The officials of the Fire Department were rather doubtful as to whether to get an entirely new source of supply or to improve existing water supply facilities. A project calling for the installation of an impounding reservoir and a pipe line to Hyde Park was submitted to the voters, but was defeated because of its high initial cost. Other projects involving surface supplies or gravel wells were considered, but it was finally decided to keep the existing source of supply and to improve the supply works.

Crum Elbow Creek flows through rather sparsely inhabited territory. Its dry weather flow is sufficient for the needs of the community, with an average consumption of 30,000 gallons per day, and no storage is required. The water in the brook has a high turbidity during periods of heavy run-off, and because the creek flows in part through swampy ground, has a rather unpleasant taste. The pollution load is low, but as there are a number of houses above the intake, it is imperative to provide proper purification of the water.

The writer was employed by the Fire Department in October, 1934, to design and supervise the construction of improvements to the supply works. Bids were taken and contracts awarded on November 27, 1934. Although the project involved a small total cost, it was decided to split the work up into four separate contracts so that local contractors could submit bids.

Contracts for the furnishing and construction of the improvements were awarded to the following contractors: for furnishing pumping equipment, Fairbanks, Morse & Co.; for furnishing filter equipment, Roberts Filter Manufacturing Co.; installation of mechanical equipment, Turbine Equipment Co.; construction of new building, James A. McKenna.

Pumping Equipment

The new building is 43 by 26 feet in plan and is connected to the old pumping station. The architectural treatment of the building is plain. It is constructed of common brick and has a composition roof, wood trim and concrete floors. The intake chamber opens into the building and a small channel leads to it from the center of the creek.

Pumping equipment consists of one 250-g.p.m. motor-driven pump for regular duty, both the motor and pump being made by Fairbanks, Morse & Co.; and one 250-g.p.m. gasoline engine driven pump for emergency use, this pump being manufactured by Fairbanks, Morse and the engine by Chrysler. The centrifugal pumps are series connected, working against a suction lift of 11 feet and a discharge head, including friction, of 190 feet. The pumps are designed to operate singly but can be operated together in case of emergencies, in which case the output is approximately 470 g.p.m. The wire-to-water efficiency of the motor-driven pump is approximately 60 per cent under normal operating conditions.

The engine-driven pump is primed manually through a bypass around the check valve, and the suction line is equipped with a foot valve. In actual practice it has been found unnecessary to use the priming line, as the foot valve is exceptionally tight. The motor-driven pump is primed automatically by an Apco primer. The water level in the storage tank is maintained at all times within 5 feet of the top by a gage-type automatic control equipment furnished by the Electric Controller & Manufacturing Co., which also furnished all electrical equipment.

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Chemical Treatment

In entering the plant the water passes through a bar screen leading into the intake chamber. There it receives its dose of alum and chlorine applied at the pump suction. The chlorinator is of the "Equiscale Visible Vacuum" type, made by Wallace & Tiernan Co., Inc., and the alum feed is of the MOF dry feed type, made by the same company. Both the alum feed and the chlorinator are hooked up so as to start feeding automatically when the pump is thrown in and to stop when the pump shuts off. The raw water has a pH of 7.8 and generally requires an alum dosage of about one grain per gallon.

After leaving the pump the water flows under pressure through the reaction tank, a steel tank 8 x 18 feet in diameter with piping so arranged that a spiral flow is imparted to the water. The capacity of the tank provides a 25-minute reaction period. The reaction tank is an exact duplicate of the shell of the pressure filter, so that in the future interior piping and sand can be installed and the reaction tank turned into a presure filter, a new reaction tank being installed in the old filter building.

Filtration

The pressure filter is an 8- x 18-foot unit made by the Roberts Filter Manufacturing Co. The normal rate of flow is about two gallons per square foot. The filter is washed by back flow directly from the distribution system, a Ross valve being set on the wash line to maintain an even pressure of approximately 15 pounds at the filter. A mercury monometer type loss of head gage is provided to measure the loss of head which with a clean filter is approximately 2½ feet. Water leaving the plant is measured by a venturi meter of the indicating, recording and totalizing type manufactured by the Simplex Valve & Meter Co.

As was previously mentioned, the water gave some trouble because of its strong swampy taste. It was hoped that the new reaction tank and improved method of applying alum together with the lower rate of filtration would eliminate part of this difficulty. Under actual operating conditions, however, although this taste was lessened somewhat, it was not eliminated. Through the courtesy of the Industrial Chemical Sales Corporation, a mixture of activated carbon and alum is being tried out instead of the granulated alum used previously. It is still too early to state definitely whether the use of this material will at all times eliminate the disagreeable taste; however, during the month or more that this material has been in use, the swampy taste has been entirely eliminated and considerable public comment in favor of the absence of taste in the water has resulted.

Costs

The total cost of the work, including engineering and legal fees, was about $16,000. It is anticipated that a few hundred dollars additional will be spent for a WPA project covering the removal of loose rock from the intake pond, the construction of a small weir chamber, to measure wash water flows, and the general cleaning up and beautifying of the grounds around the plant.

What the Depression Has Done to Cities

By **CLARENCE E. RIDLEY and ORIN F. NOLTING**

DURING the depth of the depression in 1933, when the hue and cry everywhere was "The cost of government must be reduced," the International City Managers' Association published a pamphlet, "How Cities Can Cut Costs," setting forth practical suggestions for constructive economy in local government. Now that an upturn is apparent, it may not be amiss to appraise the effect of the depression on municipal activities. This is the purpose of the thirteen chapters in the pamphlet; "What the Depression Has Done to Cities," published July, 1935.*

A persual of these individual stories, function by function, reveals the serious, sacrificial, and at times heartbreaking struggle, that has been made against the vicissitudes of the depression in an effort to preserve for the citizens as much as possible of community services. In many cases there have been defeats and serious losses. The worst effect of the depression is illustrated, naturally, in those communities where dangerous cuts or even entire eliminations of services have been made, often with far-reaching and long-run consequences in the form of illiteracy, crime, delinquency, ill health, and other hazards to good community living conditions. Another evil of the depression, although much less important than the foregoing, has been the effect, through severe pay cuts and otherwise, on the morale and personnel of the services. The injection of the relief idea into city services will in many instances prove to have undermined the gains which the merit system has to its credit. Then, too, because of the need for relief subsidies, there has been a noticeable decline in local autonomy; while this may be an advantage, to many it will appear as a permanent loss for which the depression must accept blame.

But serious as these bad effects of the depression are, the cloud undoubtedly has a silver lining and many good results have come from the depression, or at least from the civic spirit and ingenuity induced by it. No particular situation may be said to be all good nor all bad, but certainly some measure of benefit has been derived by cities in the following ways:

1. They have cut unit costs by exercising their ingenuity and by seeking out the best methods and practices in other cities.
2. They have become accustomed to adjusting their procedures, organization, and programs to rapidly changing conditions, thereby securing dynamic rather than static government.
3. They have come to realize, through the debates over budget cuts, as they never did before, how indispensable to community welfare are their services and activities and how loath are their citizens to give them up.
4. They have been compelled to examine critically an inherited, antiquated revenue structure; and in many cases, also, to question the feasibility of the existing administrative areas and other political arrangements.
5. They have learned to cooperate with other cities in attacking common problems and also with other levels of government, realizing that the important thing is the substantive service to the citizen, rather than the agency that furnishes it.
6. They have seen the independent spirit of decentralized city boards and commissions minimized, in the realization that the departmental troubles and interests are after all common to the city as a whole.
7. They broadened their outlook, being in many cases compelled to admit their prosperity policies were shortsighted, both for what they did and for what they neglected to do; and they have become vitally interested in city planning in the deeper sense.
8. They face the future with seriousness and determination, knowing the path will not be easy and that the "city" must muster all its civic resources to survive and to prosper.

This is all to the good, and it is to be hoped the lessons of the depression will not be forgotten.

* See p. 109 of this issue for a notice of the pamphlet, from the Foreword of which this material is taken.

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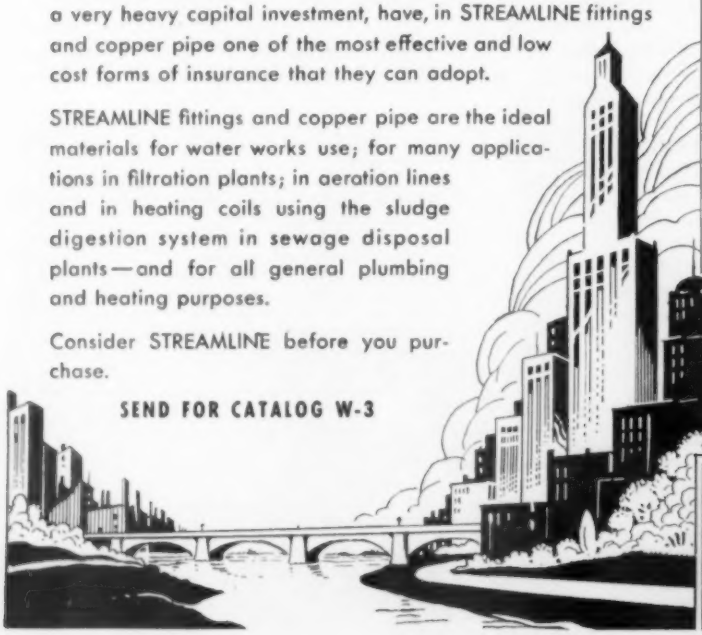

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Remedies for Water Larceny

By ARTHUR L. H. STREET

WHAT recourse does a water company or water department have against a consumer caught stealing water by by-passing a meter or otherwise rendering it ineffective? Can service to him be discontinued? Can he be held liable for the water wrongfully taken, in view of the fact that the quantity taken is not ordinarily subject to proof?

Although we deal with the subject from the standpoint of civil remedies, it is not to be overlooked that it is well-settled law that the taking of water under such circumstances constitutes larceny. So, in addition to being subject to civil penalties, the guilty person is amenable to fine or imprisonment the same as a thief of swine or chickens. From an ethical standpoint, the hog or chicken thief is entitled to more respect, for he at least takes the sporting chance of being punctured by buckshot, by going to the victim's premises, while the water thief skulks about on his own premises.

Recovering for Water Taken

No doubt the nature of legal remedy available to a water company or water department in the civil courts has been frequently debated in the lower courts, without the higher courts having been called upon to review the conclusions reached. But the law reports do not contain many cases where tribunals whose decisions are authoritative have been called upon to declare the law on the subject.

In three leading cases water departments elected merely to seek recovery for the water stolen, without attempting to discontinue the service as a penalty for the theft.

In the case of *Krumenaker v. Dougherty*, 77 N. Y. Supp. 467, it was discovered that plaintiff maintained an unmetered pipe on his premises, in addition to a metered pipe. A stop-cock was used to cut off the metered pipe when water was illegally secured through the unmetered pipe. Defendant, Water Supply Commissioner, billed plaintiff for nearly $1,000 as covering water illegally taken and not paid for over a period of nearly six years, threatening to discontinue the service unless the bill was paid. Plaintiff sued to enjoin the discontinuance, but the Appellate Division of the New York Supreme Court ruled:

"It does not need argument to show that defrauding the city of its revenues authorized the Commissioner of Water Supply to take action thereon, and, *if the bill was not paid for the water used*, the statute furnishes abundant remedy for the proposed action."

The decision was supported by New York City charter provisions authorizing cutting-off of water service for violation of water department rules, etc.

Precise Proof Not Required

There was no precise proof as to just how much water had been stolen, but the Court sustained an award on the basis of an estimate arrived at by showing the difference in consumption in plaintiff's business over periods of several weeks each, according to whether the water passed through the metered, or the unmetered, pipe. The Court said:

"The plaintiff has been treated as fairly by the defendant as he was entitled. By his act the accurate measurement of the amount of water which he has consumed, and for which he has not paid, can only be approximately determined, and he is in no position to ask that the Court strain any rule in his favor."

A similar conclusion was previously reached by the New York Court of Appeals in the case of *Brass v. Rathbone*, 153 N. Y. 435, where the Water Commissioners of Albany were held to have properly threatened to cut off water service unless payment should be made for water taken in excess of the maximum daily quantity allowed under an ordinary flat rental. Installation of a meter had disclosed that 2,000 to 5,000 gallons were being taken daily, although the rate being paid did not permit more than 150 to be taken.

But in this case, while governing statutes and rules of the Water Department abundantly sustained the right to discontinue the service *on default in paying for water improperly taken*, the opinion seems to show that the service could not have been discontinued merely because of the consumer's dishonesty, in the face of his willingness to pay for what he had improperly taken.

Recovery Sustained

In the case of *City of Kalamazoo v. Standard Paper Co.*, 148 N. W. 743, the Michigan Supreme Court upheld recovery of more than $15,000 for water taken through by-passing a meter. The city's claim was based upon the greatest quantity of water that could have been taken by the by-passes, and the Court said that defendant was in no position to complain of any uncertainty as to just how much water was wrongfully taken, because defendant's own act caused the uncertainty. In this case the Water Department was sustained in its right to recover for water taken and not paid for, apparently without any threat of discontinued service.

While the cases above cited seem to be so sound in their reasoning as to forecast what almost any court in any state might decide, as to the right to recover for water stolen and to discontinue service on the consumer's refusing to pay therefor, we do not believe that satisfactory authority will be found to uphold the right of a water company or department to discontinue service without affording the guilty consumer an alternative opportunity to pay for what he has stolen. At least, in the absence of a statute in a particular state expressly authorizing discontinuance of service as a penalty for the theft, without regard to the consumer's willingness to make amend for the theft, we seriously doubt the right to resort to that drastic remedy. Otherwise, it would seem that a street-car rider dropping a single counterfeit token in a fare box might be permanently debarred from ever riding the same street-car line again, and that any user of public utility service might be denied further service on once defrauding the utility.

Opinion Limits Remedy

Said the Wisconsin Supreme Court in 1858 in the case of *Shepard v. Milwaukee Gas Light Co.*, 6 Wis. 526, 536:

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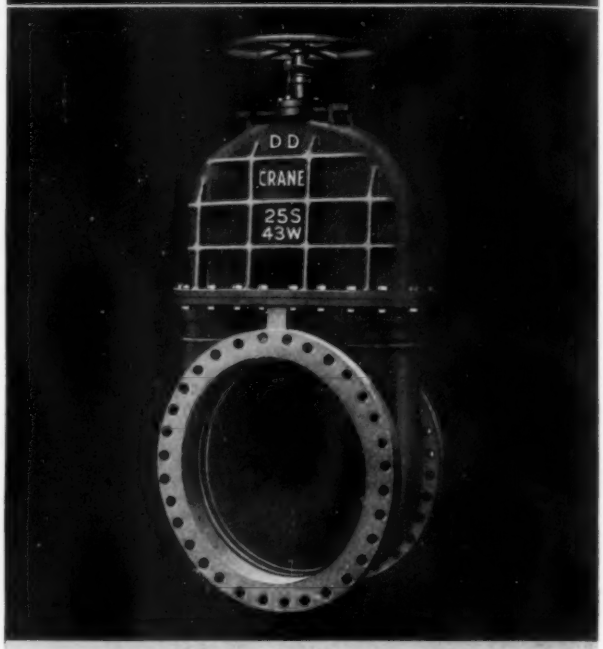

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"Another regulation reserves to the company the right at any time to cut off communication of the service pipe, if they shall find it necessary so to do, to protect the works against abuse or fraud. Here the company assume the whole power to decide upon the question of abuse or fraud, either in fact or in anticipation, without notice, without trial, of their own mere motion. This summary jurisdiction would not be given to any of the judicial courts in any case but upon the most urgent emergency. Much less could it have been the intention to confer such power upon one of the parties to a contract of such vital importance. It is no hardship for the company to resort to the same tribunals, upon like process, for protection against fraud, as the law provides for individuals."

In the case of *City of Van Alystyne v. Morrison*, 33 Tex. Civ. 670, one of the Texas Courts of Civil Appeals decided that the city was not entitled to cut off a consumer's water supply without notice because he was using water in his bathtub without paying an extra charge fixed for that service. But the decision was largely influenced by the facts that no extra rate had been prescribed by the City Council and that the consumer was innocent of intent to defraud.

Most Favorable Decision

The strongest decision supporting the right to cut off service for violation of established regulations seems to be that reached by the Kansas Supreme Court in the case of *Shiras v. Ewing*, 43 Kan. 170, and it will be noted that even there the consumer was first afforded an opportunity to pay for water wrongfully consumed.

In the last cited case, a householder's water supply was cut off for two months because he violated the water company's rules by permitting water to run to waste. But the service was discontinued only after he had refused to pay $1.50 to cover the waste.

In that case the consumer's attorney argued that his obligation to comply with regulations of the company was so far independent of his right to service under his contract with the company that the company was limited to an action for damages for any violation of the rules governing use of water. Rejecting this contention, the Kansas Court said:

"We do not think it reasonable or practicable to hold that for all the violations of the use, by its patrons, of the water supplied under its contracts therewith, the company shall be put to an action for damages. To so hold would be to deprive the company of any remedy, and leave it subject to the whim of each individual patron, so far as the use of water supply is concerned, since it would be wholly impracticable for the company to bring an action for damages whenever the rules, or any of them which are a part of the contract, were violated by its patrons. It follows, therefore, that the company must be permitted to make reasonable rules for the government of its customers in the use of its water supply, and enforce such rules by shutting off the customer's water, as a penalty for violation thereof, whenever the contract with its customer is made subject to such rules, the courts reserving the right to say in any particular cases whether the rules are, or are not, reasonable. * * * A rule of the company against the unnecessary and useless waste of the water supply is certainly reasonable."

But, as above noted, the Court mentions the circumstance that before the water was shut off the consumer was given an opportunity to pay for the water wasted.

The Prevailing Policy

Thus it will be seen that in most of the cases on this subject that have come before the appellate courts, the consumer has been given an opportunity to pay for water wasted or wrongfully taken as an alternative to discontinuance of service to him. And, in the light of the precedents above cited, we believe that this is a safer course for a water company or water department to pursue than to shut off water without giving the consumer an opportunity to make amends, no matter how dishonest he may have been.

In other words, too literal application should not be made of such abstract declarations as the following made by the Court of Chancery of New Jersey in the case of *Millville Improvement Co. v. Millville Water Co.*, 113 Atl. 516:

"It is well recognized that a water company, though charged with the public duty of furnishing water to all of the inhabitants without discrimination, may adopt reasonable rules for the conduct of its business, and the operation of its plant, and such rules, so far as they affect its patrons, are binding on them, and may be enforced, even to the extent of denying water to those who refuse to comply with them. Such power is not dependent upon any express legislative authority; it is incident to a corporation of that nature. * * * This right of reasonable regulation is uniformly held to include the right to shut off the water supply of delinquents."

General Electric Co. Aids Better Housing

THE organization of a separate company known as Houses, Incorporated, for the prime purpose of cooperating in the encouragement of house-building of all worthy types, has been announced by the General Electric Co. in a joint statement by Gerard Swope, President, and Owen D. Young, Chairman of the Board. It will be the purpose of Houses, Incorporated, to cooperate with others in the development of houses of any type which seems worthy and promising; to conduct research work; and to assist in the management and financing of such enterprises.

Charles E. Wilson, Vice-President of the General Electric Co., will be Chairman of the Board of the new enterprise; Foster Gunnison, who has been associated with Houses, Incorporated, since its inception, will be President; James L. Hagar and J. A. Olson, Vice-Presidents. The Directors, in addition to Messrs. Wilson, Gunnison, and Hagar, will include P. D. Reed, J. W. Lewis, and Vice-President T. K. Quinn of the General Electric Co. Offices will be located in the General Electric Building, 570 Lexington Avenue, New York City.

The announcement by Messrs. Swope and Young said:

"Since it is primarily concerned with the interior of mechanism of the house, the General Electric Co. has not been, nor will Houses, Incorporated, be, the proponent of any particular type of construction enclosure whether it be pre-fabricated, partly pre-fabricated, or the traditional enclosure.

"As a recent example of its interest in this field, General Electric has encouraged the construction of pre-fabricated homes, and at the same time has established, as a result of a nation-wide architectural competition, a program of building houses throughout the country of different types, with modern equipment for purposes of exhibition and comparison as to costs and service with the pre-fabricated house.

"Houses, Incorporated, will not itself engage in the construction or sale of houses. It will undertake to help others in worthy projects and to carry on fundamental work and experiments for the particular benefit of those interested in perfecting modern houses. Only by such experimentation and effort in the construction of small homes can their quality and convenience be improved and their cost diminished so as to bring them within the purchasing power of greater numbers of people."

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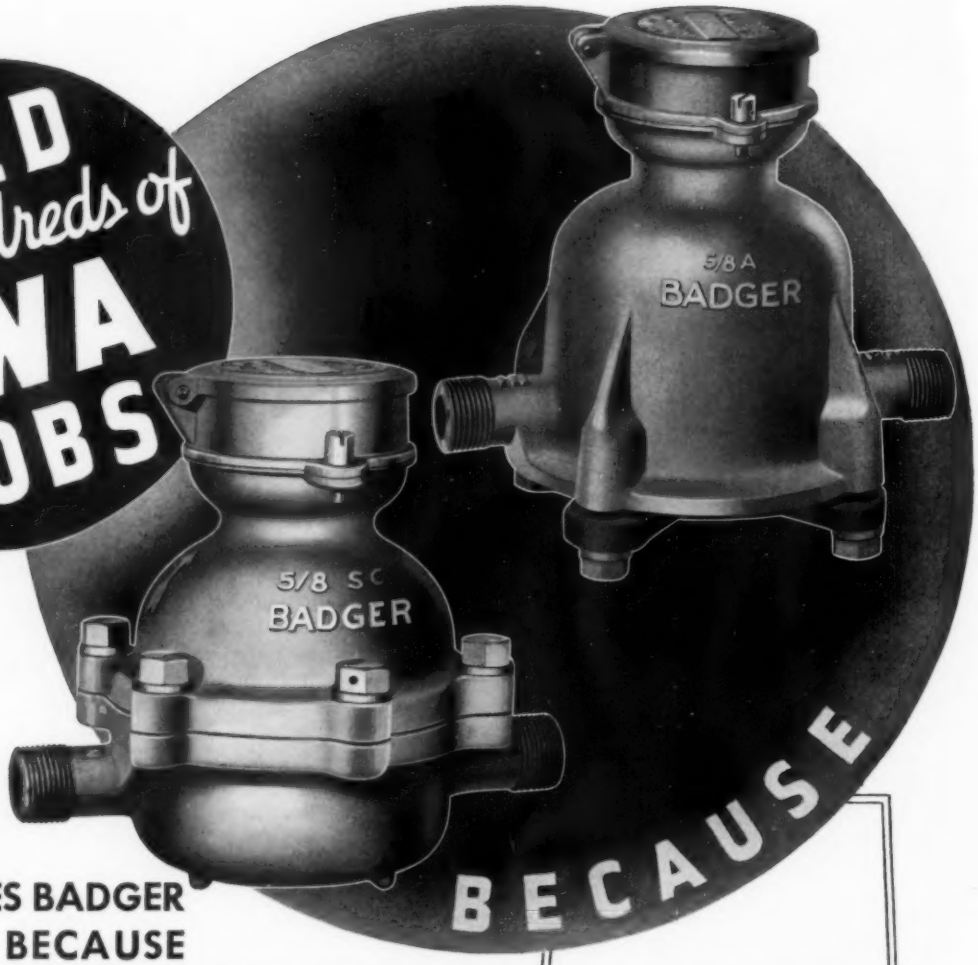

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BADGER *Water* METERS

One City Takes Its Medicine

By L. R. CHUBB

DEPRESSION storm-clouds are still with us, but some of the silver linings are now visible. In Yonkers, N. Y., for instance, a successful struggle against apparently insurmountable financial difficulties has brought about an unprecedented degree of popular interest in government and of intelligent planning for the future.

In December, 1933, Yonkers was a sick city. An ugly red rash was spreading through its accounts. Policemen, school teachers, and other employees were three months behind in their salaries. To those who would take them the unfortunate employees discounted as best they could. the city was issuing warrants receivable for taxes, which The city had some six millions of tax anticipation and other short-term notes past due. Westchester County had been nursing it along by permitting it to fall behind in remitting county taxes, until the sum overdue amounted to $1,616,000, some of which the city had collected and used for other purposes but more than a third of which it had never collected at all. And to cap the climax, its old nurse, the county, in order to borrow money to meet its own pressing obligations, had to agree with its creditors to use if necessary the drastic provisions of the Westchester County tax law, which permitted it to impound all money in the city treasury until the county tax was paid.

To the bedside of this anemic and gasping patient, at the suggestion of a group of noteholders, the Consultant Service of the National Municipal League, directed by Dr. Thomas H. Reed, was summoned by Mayor Joseph F. Loehr. The Consultant Service found the Mayor and his colleagues of the Council ready to take heroic measures. The tax rate for 1934 was increased from $3.11 to $3.79, the threat of a tax strike being averted by the persuasive powers of the Mayor, coupled with the fact that more than a million dollars was cut from the current operating budget of the city and its school system. A number of minor administrative changes in the interest of economy recommended by the Consultant Service were also adopted, notably the appointment of a competent accountant on the Mayor's staff to enable him really to direct the city's financial policy.

The result of these heroic remedies was felt almost at once. Not that there was not plenty of criticism and even of opposition. The police refused to reduce their own salaries by making a voluntary contribution, and the cut had to be effected by ordinance. But as income picked up and expenditures stayed down, the city's credit position steadily improved. By the summer of 1934 noteholders were ready to listen to proposals of refunding, and by autumn after long negotiations not only were the notes successfully refinanced, but a group of large New York banks agreed to loan three millions of new money (to be repaid in three installments beginning this year,—enough to pay off the county, the back salaries, and other floating debt. The figures of the Consultant Service demonstrated the city's ability to meet its debt service obligations without serious difficulty, and ingenious legislation framed by Hawkins, Delafield and Longfellow bound the city to what is in effect a cash basis of operation.

The Patient's Recovery

Today Yonkers is out of the red. While increasing its bonded debt only four millions between January 1, 1934, and July 1, 1935, it has during that period reduced its other debt by eight and a half millions, besides bringing and keeping up to date its payments of county taxes. Its tax rate has gone down from the 1934 fever-point of $3.79 to $3.39 for 1935. Its collections of current taxes, which had dropped from 85 per cent in 1931 to 69 per cent in 1933, came back to 71 per cent in 1934, and for the first seven months of 1935 were 56.5 per cent, as compared with 53.6 per cent in the same period in 1934. Its collections of delinquent taxes, which had dropped to 38.0 per cent of the taxes outstanding in 1933, rose to 52.6 per cent in 1934; they were sufficient to bring total tax collections to 95 per cent of the enormous levy of that year, and this year the total collections will at least equal the year's levy.

This is concrete testimony to the renewed confidence which the vigorous action of the city administration has inspired in its citizens. And best of all, the city has learned its lesson well and has prepared a six-year financial plan based on careful study of future needs and future ability to pay, which insures the wise maintenance and improvement of the city without feverish tax-rates. If patients always took the doctor's prescription so manfully and did not throw it out the window when they begin to feel a little bit spry again, epidemics of tax trouble could be controlled.

WPA Advisory Board

HARRY L. HOPKINS, Works Progress Administrator, recently announced the appointment of Governor Paul V. McNutt of Indiana as a member of the Works Progress Advisory Board.

Including Governor McNutt, the Board now comprises four members. They are Edward A. O'Neal, III, of Alabama, President of the American Farm Bureau Federation; Ernest L. Klein of Chicago, associate publisher of *National Weeklies* and publisher of the *Staats-Herold;* and George Creel of San Francisco, author. The Board will consist of from five to seven members. Governor McNutt is Chairman of the Executive Committee of the Governors' Conference, a national organization of state governors, and was National Commander of the American Legion in 1928 and 1929.

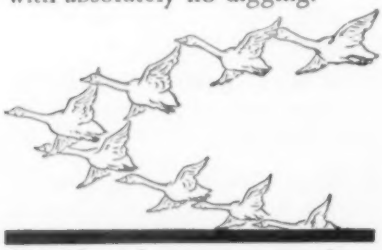
The Works Progress Advisory Board was established to provide WPA with the benefit of advice from qualified people representing important segments of American life. Members of the Board will act as outside observers of the Works Progress Administration activities and have been asked to give the assistance of unbiased, unobstructed perspective of its operation. Members of the Board will receive no salary, except the customary $25 a day paid advisors when actually on Government business.

TO WATERWORKS MEN WHO ARE THINKING NOW ABOUT WINTER

Most cities have had enough water-supply grief in the past two winters to last for the next twenty. Of course it has been unusually cold, but the fact is that a series of mild winters has let too many engineers be persuaded that inadequate equipment, shallow trench-depths, and temporary repairs would do for another year or two.

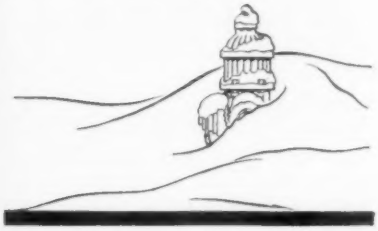
Available federal funds make today the ideal time to recondition your water works system.

Let's ask one question that's pretty much to the point: Suppose you could find a hydrant that won't freeze up at any temperature, that can't be heaved loose by frost of any depth, that won't leak no matter where a skidding car may smash it, and one that can be repaired in the dead of winter with absolutely no digging.

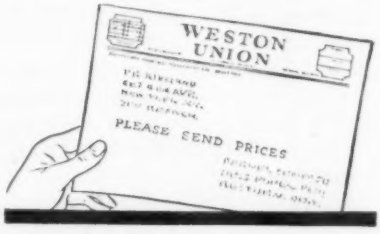


Wouldn't it be an economy to have hydrants like that in the ground before winter starts? You can do it easily. The name is Mathews Hydrants, and here's proof of

every claim. . . . A properly set Mathews Hydrant will drain completely in less than two minutes. It doesn't have time to freeze even in sub-zero weather. Water-pressure is sealed away from the operating threads. No ice can form on them. Rain and spray are shed from its roof-like shield-operating nut. They can't leak in to freeze or rust. In other words —Mathews Hydrants don't freeze up. . . . Mathews Hydrants can't be heaved by frozen ground, because they are surrounded by a loose sleeve-like protection case which takes the thrust and is free to slide up or down without damage. It is this same protection case which lets the standpipe be unscrewed and lifted out without digging. . . . These hydrants don't leak when broken. No matter where they are smashed off, even 4 feet underground, the compression-type main-valve holds tight, eliminating icy floods and undermined streets. . . . Above all, and whatever happens, Mathews Hydrants can be removed, repaired, replaced, or overhauled above ground and without digging. Simply unscrew the barrel (standpipe) including all working parts, lift it out, and replace it.



If you have another winter like the last two, an investment in Mathews Hydrants will pay for itself in no time at all. Your community will be blessed with 60 years or more of instant, trouble-free fire protection, as that many years of actual service by Mathews Hydrants has repeatedly proved.



Today isn't a bit too soon to start arguing with your treasurer for a shipment of Mathews Hydrants. If you want prices, drop us a line.

MATHEWS HYDRANTS

and "SAND-SPUN" PIPE, a superior grade, centrifugally cast in sand moulds.

SOLD BY ESTABLISHED 1803 **R. D. WOOD CO.** 400 CHESTNUT ST. PHILADELPHIA

FORWARD STEPS

Reported by
Municipal Officials, Chamber of Commerce Executives, and Others

Buhl Foundation Builds a Second Unit of Chatham Village

PITTSBURGH, PA.—Construction has been begun upon a $550,000 addition to Chatham Village, the Buhl Foundation demonstration housing project in Pittsburgh. Homes in the new addition will be ready for occupancy May 1, 1936, or before. The new unit increases the number of homes in Chatham Village to 197, the number of garages to 185, and the Foundation's total investment to $1,600,000.

Decision to build at this time reflects the Foundation's confidence, after three years of experience during the most acute period of the economic depression, in the investment soundness of the Chatham Village type of residential community. The first unit of 129 homes, opened for occupancy in the spring of 1932, has been 99 per cent productively occupied since that time. Planned as a demonstration of commercial practicability, the Chatham Village buildings are amortized over a period of 31 years and administered to yield a net return of approximately 5 per cent per annum after all charges, including amortization.

Of the 43-acre site, only two miles from the heart of downtown Pittsburgh, 16 acres have been allotted to dwellings, 4 acres to a recreational center and 23 acres to woodland trails.

Homes in Chatham Village are rented, not sold. Lawns and gardens as well as house maintenance are completely cared for by the management.

The new homes, in all essential respects, will be duplicates in plan of the present types of two and three bedroom houses. A few larger homes of four bedrooms and two baths are also being provided. Homes face away from motor roads and look out upon central gardens. Featuring the new gardens are a number of ancient oak trees, some more than 36 inches in diameter.

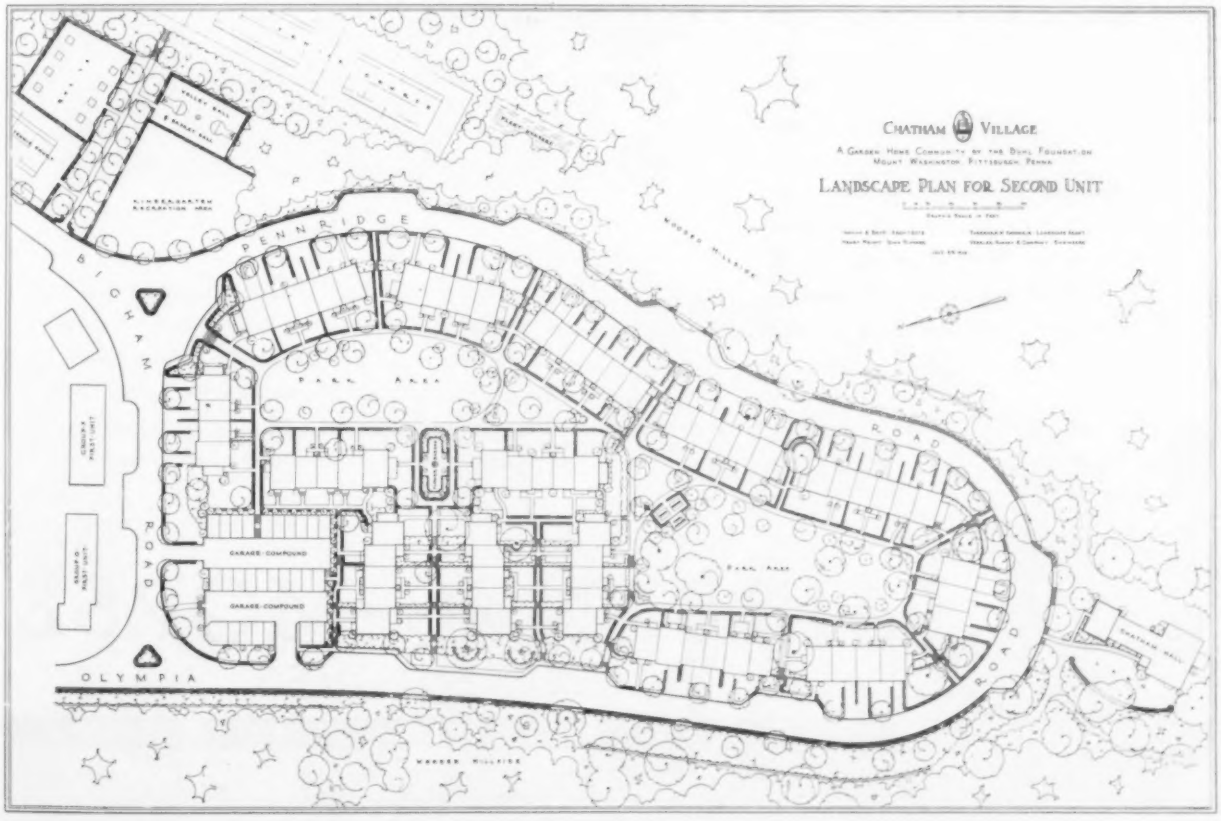
The site planning for the new addition was directed by Henry Wright of New York, who, with Clarence S. Stein, planned the first unit. The architects are Charles T. Ingham and William Boyd of Pittsburgh, who were recently awarded the medal of the American Institute of Architects in the Better Homes in America small house competition for the design of one of their Chatham Village groups. Theodore M. Kohankie of Pittsburgh is the landscape architect.

The recreational facilities of the Village will be largely extended in connection with the new unit. Chatham Villagers will have four tennis courts, quoit courts, a mushball field, a boys' and girls' playground, and an outdoor nursery playground under the supervision of a trained instructor. The management is making extensive improvements to a twelve-room club house which serves as the center for community social and cultural events.

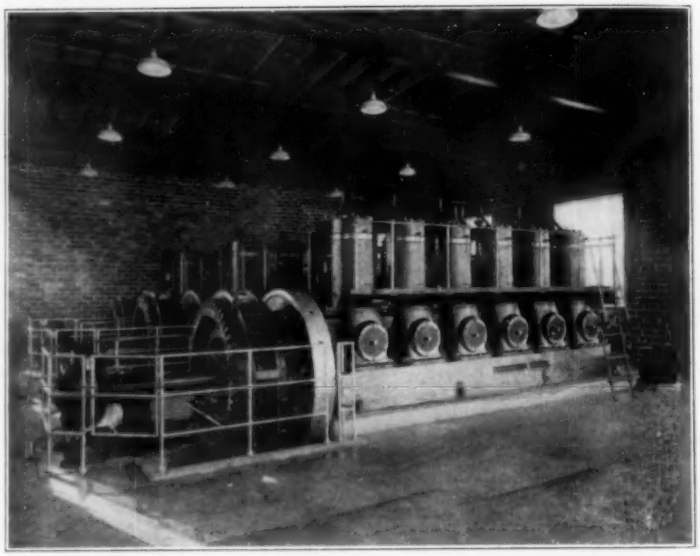
Chatham Village is peopled chiefly by clerical workers, junior executives and professional people from downtown Pittsburgh and teachers in the universities and public schools. They comprise the group for which the original project was conceived and built.

Rents in the new unit, as in the present Village, will average about $10 per room per month. Houses will be of brick veneer construction, insulated, weather-stripped, with tile bathrooms and hardwood floors; kitchens will have modern steel cabinets, forced ventilation, and electrical refrigeration; roofs are slate and all water pipe is copper. Each home is separately heated by a natural gas burning steel boiler with thermostatic control.

Pittsburgh building costs have been traditionally high because of high wage



LAKE MILLS (POP. 2000) PAYS ITS WAY WITH F-M DIESELS



Business is good in Lake Mills, Wisconsin. This hustling community has but two or three families on relief, and all but two or three homes are connected to the municipal power plant.

Lake Mills enjoys one of the lowest electric light rates of any community in Wisconsin under twenty thousand population. And in spite of this fact, its municipally owned F-M Diesel powered light plant turns over $12,000 in cash to the town as net profit every year. This is in addition to setting up depreciation and overhead reserves. The entire plant, valued at $300,000, has long since paid for itself.

Does municipal ownership pay? Lake Mills and hundreds of other progressive communities point to their F-M Diesel powered plants and answer an emphatic YES! Your town can do the same. For complete information, address Fairbanks, Morse & Co., 900 S. Wabash Ave., Chicago, Ill. 32 branches at your service throughout the United States.

Pioneer Designers and Manufacturers of POWER, PUMPING AND WEIGHING EQUIPMENT 105 Years

F M

FAIRBANKS-MORSE
DIESEL ENGINES

6453-OA98.107

scales, high land prices, and high site development costs imposed by rugged terrain. The rent levels reached in Chatham Village for the type of houses provided are considered extremely moderate.

CHARLES F. LEWIS,
Director, The Buhl Foundation.

The Duluth School Board Changes the Bond Picture

DULUTH, MINN.—At the beginning of 1935 the Duluth School Board had an outstanding bonded indebtedness of $3,550,000; during the year it has refunded $600,000 and sold new issues amounting to $377,000, and during the remainder of the year it will pay off $185,000 of old issues, which will leave the Board with a bonded indebtedness of $3,742,000 at the beginning of 1936.

A $200,000 issue of 4.5 per cent term bonds sold in 1915 and due in 1945 was refunded by issuing and selling $200,000 in serial bonds at 2.6 per cent, payments falling due between 1938 and 1949 inclusive. The total interest cost of the old issue from the present date until maturity would have been $91,500, and the total interest cost of the new issue from date until maturity is $51,150—a saving of $40,350.

The other refunding transaction consisted of calling in two issues of 4.5 per cent term bonds, of $200,000 each, one dated 1910, due in 1940, and the other dated 1913, due in 1943, and issuing and selling in their place $400,000 in serial bonds at 2.7 per cent, maturities of $20,000 falling due in each of the years 1938-1941, and $40,000 in each of the years 1942-1949. On this transaction there is an interest saving over the whole period amounting to $12,060. If half of the cost of the new issue is charged against each of the old, $9,720 is lost on the issue falling due in 1940, and $21,780 is saved on the issue falling due in 1943.

On the whole refunding transaction, involving $600,000, the interest saving is $52,210, but the actual saving will not exceed $50,000, owing to the cost of the refunding transaction.

Refunding these issues has the additional advantage of removing the heavy payments which would have fallen due in 1940, 1943, and 1945, and spreading them out over the greater number of years. A portion of the maturities had to be extended, and the money that was originally borrowed in 1910 will not be wholly paid back until 1949, which demonstrates that bonding is one method of permitting the coming generation to pay for its own education after it has reached maturity.

"THE TAXPAYERS' BUSINESS,"
Duluth.

EDITORIAL NOTE.—Among other notable examples of low-interest bond issues might be cited the recent sale by the town of West Springfield, Mass., of a $50,000 issue of 1- to 5-year serial bonds, at a net interest rate of 1.38 per cent. Several other sales at a yield of less than 2 per cent are listed in the Municipal Bond Market column on page 93 of this issue.

Buffalo's New Swimming Pools

BUFFALO, N. Y.—Three new pools were opened in Buffalo the last day of June, this summer. The main pool and the diving pool are shown here and present a most attractive appearance, surrounded by the trees of Cazenovia Park and furnishing healthful recreation to many swimmers and on-lookers. The third structure is a wading pool, not pictured; it is 76 feet square, and slopes from 1 inch at the edge to 2½ feet at the center. A population of 50,000 closely adjoins the Park, obviously providing full patronage for the pools.

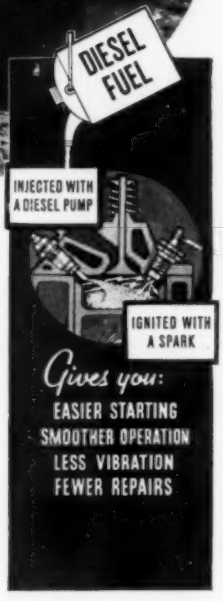
The construction was completed entirely by the Buffalo Emergency Relief Bureau, and the total cost was $75,000, 25 per cent of which was paid by the city, under arrangement with the state TERA. Credit for the planning and construction belongs to Francis J. Downing, Executive Director of the Emergency Relief Bureau, under the chairmanship of Daniel W. Streeter. Great pains were taken to confer with the officials of the National Amateur Athletic Union so that specifications for the pools would conform to that organization's requirements for swimming meets and aquatic sports.

The main pool is 227 x 77 feet, ranging in depth from 3½ to 5½ feet. The diving pool is 78 x 76 feet, with a range in depth from 5 to 12 feet. Powerful pumps to insure a constant circulation of fresh water have been installed in the basement of the locker house, as well as a modern type of chlorination plant. The water is thus assured of purity above even the highest load which the pools can carry.

The old Cazenovia Park Casino was entirely made over into a modern locker building provided with roomy dressing quarters for men and for women, with the entrance to the pools so arranged that every one must pass through the shower baths. A system of floodlighting to make the pools usable by night has been installed.

MRS. MELVIN P. PORTER,
Secretary, Buffalo City Planning Association.

LARGE POOL AND DIVING POOL OPENED THIS SUMMER IN BUFFALO



MORE PROFIT PER YARD . .
MORE YARDS PER DAY

On any job—bulldozing, scraping, grading or hauling—under any condition, sand, gravel, muck, or gumbo—in any weather,—hot, cold, rain or snow, A-C Oil Tractors are on the job, 60 minutes to the hour, piling up profits. Why? Because they're built that way.

The fundamental principle of the A-C Oil Engine is "low compression" with resulting lighter parts, smoother operation, less wear, fewer repairs and lower maintenance throughout the entire tractor. The simplicity of design, excellent workmanship and quality materials are positive assurance of long life and constant service.

That is why A-C Oil Tractors are first choice among experienced dirt movers—that is why A-C Oil Tractors are setting the pace on the country's biggest jobs—that is why **you** too should get the facts on A-C Oil Engine economy.

Track-Type and Wheel-Type Tractors . . . Power-Controlled Graders . . . Hand-Controlled Graders . . . Speed Patrol Graders . . . Elevating Graders . . . Power Units . . . Track Wagons . . . Wagon Tracks

ALLIS-CHALMERS
TRACTOR DIVISION—MILWAUKEE, U. S. A.

1½-Mile Steam Main Connects Lansing Plants

THE Ottawa Street electric generation station of the Board of Water and Electric Light Commission of Lansing, Mich., also supplies steam for a central heating system. Several years ago it became evident that additional steam capacity must be provided, for a number of old boilers that carry the heating load had so far depreciated that they could no longer be classed as of dependable capacity.

Either of two things could be done: (1) install new boilers in this station or (2) construct a steam transmission line from the Moores Park generating station, 1½ miles distant, where there was surplus boiler capacity, to the Ottawa Street station. The steam main, it was calculated, would defer the installation of additional boilers for eight years, and the difference in fixed charges between boilers and main would retire the steam-main investment in four years.

Consequently, the main was installed in 1934. It is of seamless steam tubing with ½-inch shell, 12 inches in diameter and 8,047 feet long, laid underground in reinforced concrete conduit. The manholes are 400 feet apart, and a tunnel 80 feet long carries the main under the tracks of the Grand Trunk Railway. Shielded arc welding eliminates all flanges and gaskets.

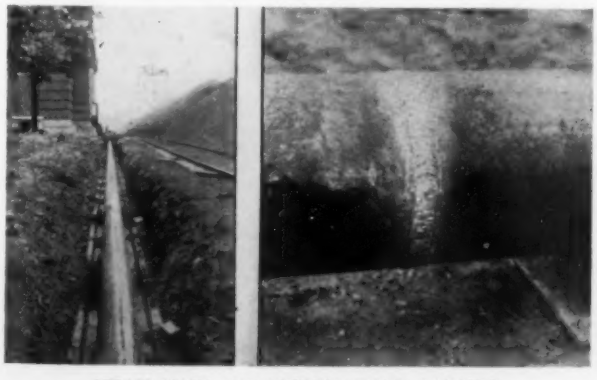
The present operation is at 270 pounds pressure and 600 degrees F., but cast iron roller supports spaced on 12-foot centers provide for sufficient travel when the steam temperature is raised to 700 degrees F.

The tubing was purchased with machine-beveled ends, the bevel being not less than 37½ degrees. All welding was done with 400-ampere gas-engine-driven welding machines and Fleetweld electrodes manufactured by The Lincoln Electric Co. All joints were stress relieved by heating slowly to a temperatue of 1,100 to 1,200 degrees F. and held at that temperature for 30 minutes. After annealing, the pipe line was tested to 800 pounds hydraulic pressure, and each section was hammered, with a 2-pound hammer, 2 inches from the weld throughout the entire pipe circumference.

Insulation against heat loss was accomplished by an inner layer of high-temperature insulating material 1 9/16 inches thick and a layer of 85 per cent magnesia 1½ inches thick. To reduce heat losses in transmission, a Blaw-Knox desuperheater left only enough superheat in the steam to counterbalance the heat losses en route and deliver slightly superheated steam at the Ottawa Street generating station.

The actual capacity of the main has not yet been determined, but it will exceed to some extent the theoretical capacity of 165,000 pounds per hour at 270 pounds initial pressure and 100 pounds final pressure.

CLAUD ERICKSON,
Board of Water and Electric Light Commission, Lansing, Mich.



STEAM MAIN AND TYPICAL WELD, LANSING

PARK PAVILION, FLANDREAU, S. DAK.

Some Business-Machine Experience in Cleveland

CLEVELAND, OHIO.—In 1932 the general books of the city of Cleveland were kept by hand in enormous Receipts and Disbursements Journals and posted to appropriate ledgers. As the result of a study, an Elliott-Fisher book-keeping machine system was installed in the Division of Accounts, together with a loose-leaf appropriation ledger. It had the virtue of furnishing the needed information almost immediately.

Then a check-writing and a check-signing machine was installed in the office of the City Treasurer, greatly reducing his routine, with an increase in accuracy and neatness. Of particular importance, it decreases the hazards of possible forgery and raised checks.

Another real asset is a Dupligraph machine (from blank paper to bills) used in the Water and Light Departments of Cleveland.

C. L. SIMPSON,
Deputy Auditor, Cuyahoga County.

Cities' Interest in Air Conditioning

MUNICIPALITIES and public utilities are interested in air conditioning planned and performed by citizens, since both the electric and water plants will benefit from the new demands for their products from this growing industry. As an instance: A. A. Ulrich, Manager of the Ohio Water Service Co., Massillon, Ohio, writes: "We are often asked for information regarding size of line, volume, pressure and temperature of water needed for air conditioning."

But cities are also customers and potential customers of the manufacturers of this equipment. As an instance of this, J. R. Coonrod, City Auditor of Flandreau, S. Dak., writes: "This city has a park and golf course containing a summer pavilion or ballroom, which we are thinking of heating—and we understand that there are plants that can be used for heat in winter and for cooling in summer."

Swimming Pool—Inland

No alga weaves its slithering lace
Where land and water meet;
No breath of salt invades this place
Man fashioned of concrete.
And only a passing swallow dips
Where gulls might swoop and swerve,
And little lads launch tiny ships
Where sails shall never curve.
No moon shall draw this water's rim
An inch across this sand
(Brought here in trucks to boldly trim
A stark, synthetic strand).
Here are no shells, no rocks, no surf,
No reek of fish, no spray—
Only a puddle carved through turf
And a midsummer day.
Yet maidens dreaming in the sun
Under their dripping hair,
And bronzed boys diving, one by one,
Climbing the slippery stair,
Are Neptune's children by strange birth
And endless mystery:
Children with feet bound to the earth
And hearts lost to the sea!

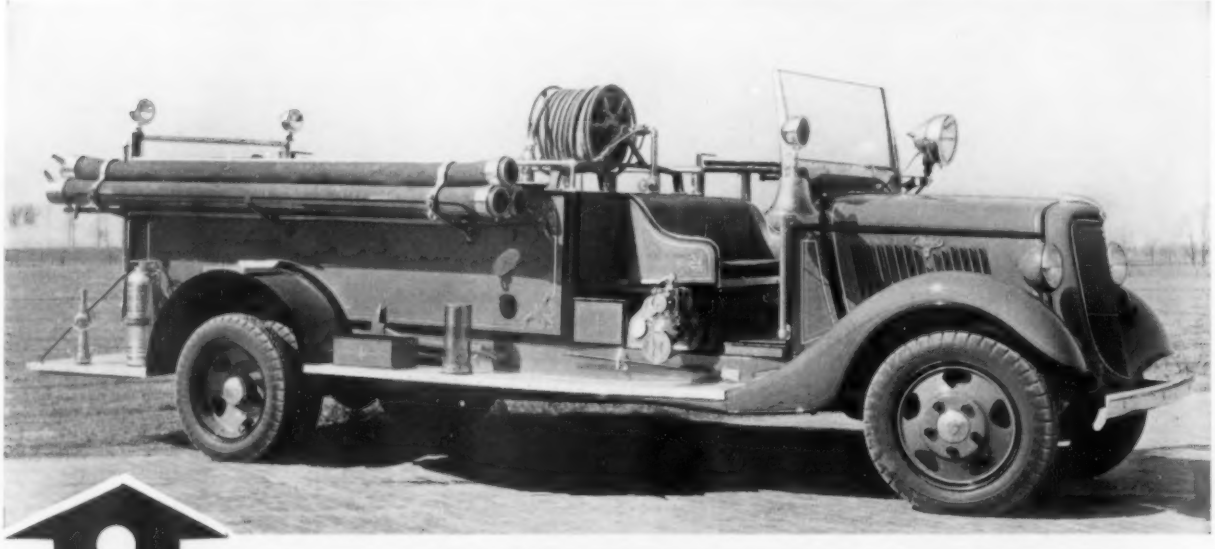
MINNIE HITE MOODY.
—From *The New York Times.*

Lowering the Cost of Fire Fighting and Reducing Property Losses by FIRE

FORD V-8 Trucks are becoming increasingly popular for fire apparatus. V-8 Economy is showing welcome reductions in the cost of fire fighting, while the low first cost of Ford V-8 equipment enables many communities to replace obsolete equipment in the face of lowered budgets.

In addition to these advantages, V-8 Performance is reducing property losses by saving valuable minutes answering alarms. Fires are often checked before they have gotten a good start.

Ford dealers will be glad to let any bona-fide city department make its own "on-the-job" test of a Ford V-8 Truck or Commercial Car with standard bodies or a Ford V-8 Truck chassis suitable for mounting fire-apparatus equipment and other special bodies. There is no cost or obligation!



FORD V-8 TRUCKS

TRAFFIC CONTROL AND FACILITATION

Conducted by Publications Committee, Institute of Traffic Engineers, 175 Fifth Ave., New York

Paul L. Green, Chairman; Melvin J. Bankhead, James R. Guthrie, T. T. McCrosky, D. Grant Mickle, Robert A. Mitchell, Edward J. O'Meara, Miss I. K. Rolph, Peter J. Stupka, J. C. Vincent, John C. Wrighton

"Accident-Repeaters" Singled Out

THE list of Nassau County, (N. Y.) drivers involved in two or more automobile accidents since July, 1934, increased during May and June to 341 members, according to data compiled by the County Traffic Survey. Thirty-eight additional passenger-car drivers graduated from the one-accident to the two-accident class, while ten passenger-car drivers were advanced from the two-accident to the three-accident group.

These 341 drivers were involved in 719 accidents, or more than ten per cent of all accidents in the county for this period. There are 145,000 drivers registered in the county, so that one-fiftieth of one per cent of Nassau County's drivers and car-operators are responsible for ten per cent of the year's accidents.

The elimination of this very small percentage would be a long step toward making our roads safe, the Traffic Survey points out. A list of these "accident-prone" drivers has been compiled and sent to village and county police departments and judges for their use in checking up on repeaters. Because of the decentralized form of civic government in the county, and the 36 independent village police departments which function in addition to the six precincts of the Nassau County Police, it has been next to impossible heretofore to obtain complete records of these accident-repeaters. As an example of this, the record of one driver is cited, living in Merrick, who was involved in accidents in Valley Stream, Freeport, Glen Cove and Lynbrook, four separate police jurisdictions. The Traffic Survey, by its card-index system, was able to trace this record through, and put this driver in the four-accident class.

Some of the records of operators in three or four accidents show a variety of accident-types, many of a serious nature. One driver in four collisions ran into a parked car on one occasion, and was later involved in a three-car accident in Merrick in which six persons were injured and two killed. It is not always possible to determine the amount of negligence or careless driving shown, in fact it is within the bounds of possibility that the driver may have been the innocent victim of two or even three reckless driver of other cars, but where the accident report shows a driver running into fixed objects or into a parked car, or a pedestrian, or losing control and running off the road, the evidence of poor driving is fairly conclusive.

Some of the recent graduates into the three- and four-accident class have records as follows:

Merrick truck driver—four collisions, two in Freeport; one each in Merrick and North Bellmore.

Merrick truck driver—struck pedestrian in Freeport; collision with passenger car, Glen Cove; ran into tree, Lynbrook; struck pedestrian, Valley Stream.

Malverne driver—Junior Operators License, injured a pedestrian in Oceanside; lost control and ran into a pole in Oceanside; collision with another car in Lakeview.

Glen Head taxi driver—three collisions with cars; intoxicated once.

Plandome driver—ran into fence; two collisions with cars, intoxicated once.

Hicksville driver—collisions with truck and bus, and ran into railroad train while intoxicated.

Locust Valley driver—two car collisions, ran down pedestrian.

Hempstead driver—collided with taxi, passenger car, and struck a pedestrian.

Freeport driver—collision with cars in Merrick, Oceanside and with two cars in Hempstead, injuring one person.

Hempstead driver—in collisions in Roosevelt, Freeport, and Hempstead.

Motor-Vehicle Education at Evanston, Ill., Bureau

THE educational program that is carried on when vehicles are inspected cannot be expected to be very elaborate, but there is a vast difference between the inspection staff which merely approves or disapproves vehicles, thus leaving the impression that the condition of the vehicle is the only objective in the tests, and the staff that takes a little time to interpret the results of the tests in terms of good driving practices.

Let me illustrate this point by a recent personal experience with the Evanston (Illinois) Vehicle Inspection Station. Just before taking my new car to the garage for inspection and adjustment at the end of the first 500 miles, I took it to the official inspection station. Everything inspected was above the lower limit of inspection standards, and a certificate of approval was issued. However (and here is where the educational opportunity was grasped by the inspector), my front wheel alignment was not perfect and one of the rear brakes was slightly less effective than the other, though both were within the prescribed tolerance. The inspector explained that the former condition would cause my tires on the front wheels to wear more rapidly than they should, and that slightly uneven braking might cause the car to "pull to one side" in making an emergency stop.

I had the adjustment made and took the car back for a re-check. The wheel alignment and brake adjustment were perfect, but that did not end the incident. The inspector pointed out that at that time of year we were approaching the season of high pedestrian accidents and that extra care, particularly in the twilight hours when there is so much driving and seeing is so difficult, was necessary to avoid these accidents.

These inspections are made semi-annually and re-checks are possible in between if the owner desires. Just after the above incident I left on a vacation trip of 6,200 miles, and on my return I took my car to the testing station again to find out whether any unsafe condition had developed. None had, but the inspector had an opportunity to tell me that we were in the vacation season and children were more apt to be on the street. They might even be playing in the street or riding bicycles there. Drivers must watch out for them.

These repeated suggestions, made at least twice a year and oftener if the owner brings in his car for inspection more frequently, are bound to impress the driver with the fact that he has a personal responsibility in driving.

I believe that official safety inspection of motor vehicles will gain general and permanent acceptance. If the standards are tightened up gradually so that not so great a percentage of the vehicles will be rejected as to bring about a public revolt against the idea, I foresee general acceptance of vehicle inspection throughout the country.

State or Cities Must Own Testing Equipment

There is a distinct advantage in official ownership of the testing equipment by the municipality or the state. It gets away from any taint of commercialism; it can encourage owners to make frequent use of the testing equipment. The privately operated station will not encourage extensive public use of the equipment. Furthermore, men who devote part time to such work will not give as prompt service as those who are doing it exclusively.

A few garages in different cities opposed the plan at first. In the beginning garages often have trouble with the plan because it requires a higher standard of workmanship than some of them have been accustomed to giving. However, my observation is that this is soon overcome and the garages find that they too can benefit by a higher standard of vehicle maintenance.

EARL J. REEDER,
Traffic Engineer, National Safety Council, Chicago.

How It Goes

MOTOR-VEHICLE deaths for the first half of 1935 totaled 15,030, against 15,400 for the record year 1934, according to National Safety Council estimates. For the 86 cities covered by the Bureau of the Census, the death rate per 100,000 population to August 3 was 24.1 against 23.5 last year.

More Than 2,500 Cars Checked for Defects in 3 Days
1,700 Automobiles Tested First Day Of Inspectio
Safety Drive Is On In City
Pass New Car Testing Ordinance
Councilmen Vote Favorably on
Car Inspection Measure De
signed to Conform With
Amended State Motor Law
Delay Placing Law Into Operation
SAFETY DRIVE BEARS FRUIT
Mandatory Motor Vehicle Tests To Be Opened Today
Examinations, Required by Law, Will Begin This Morning
MAKING STREETS SAFE IS SOUNDEST KIND OF POLITICS
Always, without exception, when adequate compulsory motor vehicle inspection is put into effect, traffic accident rates drop 'way down. There isn't a faster, surer route to enduring public good-will than to make the streets of your city safer. If you doubt it, ask any father or mother.
All over America the wave of public demand for safer streets is forcing drastic action. But mere traffic regulation can never do the job. Compulsory inspection is the answer!
Bendix, world's largest automotive brake builder and for years the industry's foremost exponent of motoring safety, has provided the perfect equipment for city safety inspection. Thorough! Tests brakes, steering, lighting, wheel alignment, with scientific accuracy! Fast! A car off the line every minute! Self-liquidating! Nominal fee pays its way! Write today for full facts and proved plans of operation. BENDIX PRODUCTS CORPORATION, South Bend, Indiana.
SAFETY CAMPAIGN TO BE LAUNCHED BY MAYOR TODAY
MOTOR VEHICLE COMMISSIONER HARNETT TO SPEAK AT THE HENDRICK HUDSON.
POLICE WIDEN THEIR SAFETY CAMPAIGN
One of Six Autos Given Tests Has Defective Brakes
MEET TO DISCUSS COMPULSORY TESTS OF LIGHTS, BRAKES
New BENDIX Civic Safety Clinic

LEFT—*Tests headlights . . . on a screen . . . in daylight!* CENTER—*Tests wheel alignment and steering with utmost precision.* RIGHT—*Tests each brake separately under electric power . . . shows total stopping ability . . . shows up "out-of-round" drums. Tests tractor and trailer trains—something no other brake testing equipment will do.*

Seven Steps to Fewer Accidents

Connecticut's New Legislation Embraces: Traffic Control—"Reasonable Speed"—Compulsory Inspection—Registration of Used Cars—Gyp Clubs—Emergency Vehicle Lights—Fees Based on Weight of Vehicle

THE Connecticut General Assembly, 1935 session now adjourned, enacted legislation designed to afford a substantial measure of increased protection to the life, limb and property of motor vehicle owners and operators within the state. Much of this legislation is effective immediately, and other parts will become effective in 1936. A brief résumé of certain provisions of several of the new Acts is given herewith.

Uniform Traffic Control

Under this Act a State Traffic Commission has been set up, consisting of the State Highway Commissioner, the Motor Vehicle Commissioner, and the Commissioner of State Police. This Commission is constituted the traffic authority for all trunk line highways and bridges in the state, with full powers to regulate traffic thereon. The Act provides for uniformity of traffic regulatory devices throughout the state, including signs, signals and markings. The Act is specific as to meaning and location of colors in traffic signals, creation of through ways and erection of stop signs thereon, and parking regulations on through ways. In the performance of its functions, it will be the policy of the Commission to achieve gradually the desired measure of uniformity, with a minimum of expense and inconvenience to all concerned.

Reckless Driving and Speeding on Trunk-Line Highways and Bridges

Connecticut's so-called speed law, which prohibits under its Reckless Driving Statute the operation of a motor vehicle upon any public highway of the state "at a rate of speed greater than is reasonable, having regard to the width, traffic and use of the highway, the intersection of any streets and the weather conditions," is amended in such a manner as to give the Traffic Commission authority to determine the speed limit on any trunk line highway or bridge and to erect or cause to be erected signs indicating such speed limit. Speed in excess of the posted limit is prima facie evidence of reckless driving. Certain stretches of highway will be zoned by the Commission, where in their opinion a control of the rate of speed is necessary. A sign reading SPEED LIMIT ZONE BEGINS will appear at the beginning of such a zone. Thereafter a graduated scale of speed limits throughout the zone will be posted by suitable signs. At the end of the zone a sign will appear, SPEED LIMIT ZONE ENDS.

The Commissioner of Motor Vehicles is empowered and required to establish and maintain a system of semi-annual inspection of motor vehicles registered in the state or operated on its highways.

Inspection of Motor Vehicles

Inspection stations are now in operation at certain points throughout the state, located with respect to volume of car registration. Registration, brakes, lights, horn, wipers, mirrors, tires, wheel alignment, steering operation, wiring and mufflers, are being inspected. A charge of 25 cents is made for each semi-annual inspection. Public approval and cooperation is manifest, large numbers of cars being brought for voluntary inspection prior to receipt of notice from the Commissioner.

Registration of Junked Vehicles

The application of this Act is broader than its title suggests. It prohibits the issuance of a registration certificate for any motor vehicle except a new one or a renewal of a registration by the same owner, until such vehicle shall have passed inspection of equipment and identity. The Commissioner shall not register any motor vehicle which has been reported to him by a previous owner as having been sold for junk, or any motor vehicle not previously registered in the state, until same shall have passed the inspection stipulated above. A fee of $1 is charged for this inspection. It is apparent that this statute will materially increase the difficulty of registering stolen cars in the state, since inspection will require satisfactory evidence of previous ownership before new registration will be granted.

Licensing Automobile Associations

This Act provides that no automobile club or association may function in the state unless it has been approved and licensed by the Commissioner of Motor Vehicles, has posted a $10,000 bond for the benefit of its members, and has paid an annual fee of $10. Licenses must be renewed each year. This bill was sponsored in the General Assembly by certain reputable automobile clubs and associations and was designed to protect the motoring public against so-called "gyp" and "fly-by-night" clubs and associations, which collect money from motorists without any intention or ability to offer anything in return.

Lighting Certain Motor Vehicles

This Act provides that all public service motor vehicles and each commercial vehicle in excess of 2,000 pounds shall be required to carry flares, flaring candles, torches or lanterns or other devices for emergency lighting approved by the Commissioner of Motor Vehicles, when such vehicles are operated on the highways of the state outside of the limits of a city, during the period from one-half an hour after sunset to one-half an hour before sunrise.

Reduced Registration Fees

Effective March 1, 1936, the registration of motor vehicles in Connecticut will be based on weight rather than on cubic-inch displacement of motor as previously. Classifications for pleasure vehicles are as follows:

3,500 pounds or less	$ 7.00
3,501 to 4,500 pounds	9.00
Over 4,500 pounds	$11.00

Commercial vehicle fees will be based on units of 100 pounds of gross weight. The net effect of the new legislation will mean that the cost of car registration in the state will be decreased by 35 per cent to 40 per cent.

In deference to the depleted pocketbooks which accompany the holiday season, the date of registration has been moved up from January 1 to March 1. It is provided that 1935 registrations will be extended for use during the months of January and February of 1936. Operators' licenses which at the present time expire on the last day of February will in 1936 expire on the last day of April.

Riding Hog-Wild Again

THIS is the problem that everybody is trying to solve, set forth graphically by the *Milwaukee Journal*.

GO AFTER THE "LUNATIC FRINGE" DRIVER!

*"There is a lunatic fringe of drivers who create hazards, for themselves and everyone else, as they rush on their heedless way . . . They are the ones who race trains for the railroad crossing — and eventually lose. They are the ones who fail always to signal that they are going to turn. They are the ones who drive while drunk, and fall asleep at the wheel, and pass on curves and at the crest of hills, and hit pedestrians and run away, and smash into trees and poles and walls, and even into buildings beside the roads. They are the 5 to 10 per cent of drivers who are responsible for 90 per cent of all accidents."

*Ladies Home Journal, July 1935.

Above — **Fleet of 1935 Harley-Davidsons just put in service by Los Angeles Police Dept.**

Inset — **left to right — Captain Walter Weyerman, Chief James E. Davis and Captain O. B. Horrell of Los Angeles Police Dept.**

IT is this lunatic fringe of 5 to 10 per cent of the drivers that cannot be appealed to with any safety campaign. The only warning they heed and the only law enforcement agency they respect is the mounted motorcycle officer. When he comes into sight, reason and sanity return with surprising suddenness. Until this lunatic fringe is made to respect the law, our traffic accident and death figures will continue to mount.

Let Harley-Davidson help you in your plans to combat these "lunatic" drivers and increase public safety on streets and highways. See your dealer now or write for special Police literature.

HARLEY-DAVIDSON MOTOR COMPANY
Dept. M MILWAUKEE, WISCONSIN

HARLEY-DAVIDSON
The Police Motorcycle

IMPROVING MUNICIPAL ADMINISTRATION

Current Items from the
Public Administration Clearing House

How Long Do Municipal Officials Hold Their Jobs?

CITY hall officials hold their jobs for an average of 7.7 years. This is revealed by a survey of tenure of office in over 900 cities which the International City Managers' Association publishes in the August issue of its magazine, *Public Management*. The data show that 10,885 officials have served the public for a total of 83,607 years.

Appointed officials tend to have longer terms of service, according to the survey. Librarians, who have the longest average tenure—11½ years, are 100 per cent appointed. Mayors, who stay in their chairs for the shortest period—3.8 years, are 100 per cent elected. In 85 per cent or more of the cities appointed officials include the fire chief, city engineer, superintendent of schools, police chief, health officer, water-works superintendent, city attorney and purchasing agent. The finance officer and treasurer, who are elected in nearly half the cities, however, show tenures of 6.5 and 7.7 years, respectively, probably, it is explained, because the voters and the council return them to office, feeling that special knowledge and experience are particularly necessary there.

The average tenure of office varies from 6.8 years for cities of over 200,000 to 8.1 years for cities between 30,000 and 100,000. With the exception of "town meeting" governments in New England, council-manager cities show the longest average tenure for all positions. The explanation may lie in the fact, it is suggested, that a great deal of emphasis is placed on professionalized service in council-manager cities.

Individual officials show much longer terms of service in some cases. As shown in *The* 1935 *Municipal Yearbook*, issued by the Association, a water-works superintendent in Massachusetts has been at his job 61 years; an Illinois police chief has administered the law for 43 years in the same town; and a Virginia mayor has headed his city for 44 years.

How long terms of local office should be is a debatable matter. Too long a term at one job may result in lowered efficiency. On the other hand, too rapid turnover, as indicated by short tenures, does not permit gaining familiarity with the work. It is suggested that perhaps the greatest significance in these records is their "definite proof of a great many instances of life-time careers in the municipal service."

More general realization of the fact that the public service does offer opportunities for careers is necessary, it is pointed out, if the most promising graduates of universities and colleges are to be recruited by our cities.

WPA Funds for Planning Studies

"THE best opportunity cities and states can ask for finding out facts about themselves is offered in the WPA funds set aside to employ white-collar workers," says Walter H. Blucher, Executive Director, American Society of Planning Officials. "This information," he adds, "is exactly what is needed to plan the social and economic future of city, state and nation."

With an estimated 750,000 non-manual and professional workers still on relief, Mr. Blucher points out, there is ample chance for employing skilled persons to obtain pertinent and valuable facts in the form of surveys, maps, and census studies, and, finally, to coordinate existing material so that planning boards will have at hand the basic data needed for actual planning.

Sample white-collar projects useful to planning are enumerated in the August issue of the American Society of Planning News Letter as including:

1. Real property inventories — like those made in 61 cities the past year by the U. S. Department of Commerce—which are of invaluable aid to the fields of housing, building construction, local government and real estate.

2. Surveys of housing, zoning and recreation facilities, carrying further those undertaken with CWA and FERA funds.

3. Surveys of water resources, stream flow, sub-surface waters, of value to all the states, but of particularly great use to the 23 states which were drought-ridden last year.

4. Traffic studies—basic information for use in determining methods of coping with the national problems of destruction and maiming of human life, waste of energy and money, occasioned by lack of provision of parking, and related unsolved difficulties.

5. Census of business enterprises and a sample survey of retail trade in June, 1934-35.

6. Health surveys—to determine the extent, type, relative seriousness, etc., of health conditions in American communities.

The News Letter notes that the Indiana State Planning Board has already had approved by the President an application for more than half a million dollars of WPA funds to carry out its program. This is the largest fund yet dedicated to the relatively new field of state planning.

The importance to planning groups of the opportunity for many related types of fact-gathering projects made possible with WPA money cannot be overstressed, it is pointed out, since most localities could not or would not otherwise undertake such studies.

City Halls Need Reference Libraries

A CASE for renewed interest in the municipal reference library movement is made by Henry Reining, Jr., of the Princeton University Faculty, in the August issue of the *National Municipal Review*.

Cities need their own reference libraries, says Mr. Reining, because the libraries can produce savings that "can be definitely as well as indeterminably valuable." Besides storing books, the municipal reference library has these functions:

1. To maintain classified collections of all sorts of other materials pertaining to city government, much of it in the form of newspaper and magazine articles;

2. To serve as the city's archives, filing city ordinances; all the publications of the city and its departments and those of its civic organizations; local history and biography; maps, pictures, reports, proceedings, etc.;

3. To act as the information bureau and publicity agency for the city;

4. To act as an intelligence unit for citizens and citizens' groups, and to serve high school and university students in their studies of local government;

5. To prepare the city's annual report;

6. To draft ordinances;

7. To compile research reports, conduct investigations and advise with city officials on matters of municipal policy.

There are in this country at present about 20 municipal reference libraries performing some or all of these services, Mr. Reining remarks. Chicago had the first one in 1900. Some of the city reference collections are simply divisions of the public library, housed in the library building. A few reference agencies are organized on an independent basis distinct from the public library system. Chicago's Reference Library, for example, is supervised by the City Council. Toledo has a reference collection located in the office of its Commission of Publicity and Efficiency. Los Angeles has three municipal reference units—power and light and public health branches in addition to the City Hall office. Some of the collections of these libraries have reached a considerable size. Chicago's has more than 160,000 books and pamphlets; Milwaukee has approximately 40,000 pamphlets, 6,000 books and thousands of newspaper and periodical clippings; Los Angeles has a total of almost 50,000 pieces in its three reference units.

The possibility of cooperation with good effect when more cities have municipal reference libraries is seen in the plans of the American Library Association for establishing in each state one clearing house of Federal, state and municipal documents, so that in the future it will be necessary for municipal reference libraries to collect material on their city only, borrowing other material as the need arises.

The Narrow Streets OF OUR OLDEST CITY

A TEST JOB FOR ANY SWEEPER *done well daily* BY THIS ONE

THE *New* AUSTIN-WESTERN MOTOR PICK-UP SWEEPER

● Among the historic features of the first American city [1565 A. D.] are narrow lanes and dead-end streets which make maximum demands on modern street cleaning equipment. Yet this city, St. Augustine, is kept clean for the admiration of tourists and citizens alike by the new Austin-Western Motor Pick-Up Sweeper.

The extreme of practically all conditions likely to exist in *your town* is met by these carefully designed features: Non-skid chassis with operator's seat located for unobstructed forward and rear view; gutter-broom self-adjusting to curve of gutters; large rear pick-up broom sweeps clean and whether litter and dirt are heavy or light, the squeegee-type elevator handles them easily. Simple hydraulic controls for accurate adjustments add effectiveness to all these features, and prevent operator fatigue.

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Why not remember to mention THE AMERICAN CITY?

Recording Underground Structures—A "White Collar" Project

A CHANCE for cities to get a complete picture of their underground structures by employing white collar workers with Federal works relief funds is called to the attention of municipal engineers in a bulletin issued by the Joint Secretariat of the American Society of Municipal Engineers and the International Association of Public Works Officials.

Every municipality, regardless of its size, it is pointed out, should possess an up-to-date record of the locations and nature of all underground structures that occupy the beds of its streets and highways. Instead of this being the common case, many communities are seriously handicapped in the proper development and control of public highways because of the lack of reliable information on what lies below. The greatest difficulties arise in connection with the old subsurface structures; therefore, the longer the keeping of such records is delayed, the greater will be the confusion in the future.

Specifications for establishing a permanent system of recording underground structures in municipalities of any size, as indicated by the Joint Secretariat, include the suggestion that a centralized bureau be set up to collect and record this information. This information would be obtained from all public utility companies, municipal departments, private corporations, contractors, engineers, architects, and property owners who may have had a hand in erecting underground structures. It is also suggested that a local utilities technical committee be formed, to bring about the best possible cooperation among these various agencies. Actual construction records and field surveys made during or after work is being finished are the sources of information that can be tapped so that the city may eventually have a complete picture of every sewer, water and gas pipe, steam main, subway and tunnel that lies beneath its surface.

"By far the largest share of a town's investment in service facilities is hidden from the eyes of the people who use it and pay for it," points out Frank W. Herring, Assistant Director of the Joint Secretariat. "To assure the maximum possible use of all these hidden investments, it is essential that an accurate record be available at all times showing their location, dimensions, materials and other characteristics. Many times the lack of definite information in this regard has led to unfortunate delays under emergency conditions, such as when a water-line breaks or when a sewer-line is stopped. Even under normal circumstances, without adequate underground maps public works departments find it necessary to dig 'test-pits' at expenditure of time and money when they want to locate existing structures so that the new subsurface improvements will not interfere with them."

Liquor Selling—Where—How?

WHERE to allow selling and how to allow serving. Cities, attempting to regulate places where liquor is sold, after a year and more of repeal, are still pondering these questions, according to the *United States Municipal News*, bulletin of the American Municipal Association and the U. S. Conference of Mayors.

Duluth, Minn., is considering changes in its regulation of liquor establishments to include the optional use of stools at bars and counters—they are now demanded—and the dispensing of drinks at the bar to male patrons only. The gentler sex, under the proposed change, will be served only at tables or in booths.

Kansas City, Mo., Council recently rejected unanimously a proposed ordinance which would have permitted drug stores to sell beer by the drink at their soda fountains. A new ordinance in this city places all establishments selling 3.2 beer under the same restrictions as hard liquor establishments.

One of the provisions of the new liquor ordinance of Miami Beach, Fla., prohibits gasoline stations from selling liquor or intoxicating beverages; another prohibits "curb service" of anything "harder" than beer and ale.

Peoria, Ill., is considering an amendment to its liquor control ordinance which would allow only "tavern cabarets," which are specially licensed, to have music and dancing with liquor. In Waterloo, Ia., and a number of other cities in Iowa there can be no dancing at all in beer parlors and taverns.

Los Angeles' municipal liquor ordinance prohibits serving of minors unless accompanied by guardian companions, demands a clear view through doors and windows of taverns, and prohibits, in addition, the use of banners, flags, canopies or awnings advertising beer and wine.

Milwaukee forbids tavern "hostesses" to urge customers to buy drinks of any kind, non-intoxicating as well as intoxicating.

Most cities have provisions in their ordinances relating to time of sale, closing hours ranging from 2 A. M. to 4 A. M. Most cities also forbid liquor-selling establishments within several hundred feet of churches and schools. A few cities are limiting the number of cabarets and taverns, for example, one to every 1,000 inhabitants.

Recent City Manager Appointments

JAMES C. HARRIS, City Manager of Fuquay Springs, N. C., has been appointed City Manager of Roxboro, N. C., to take office September 1.

Herbert T. Barclay, Engineer and former Superintendent of Water Works of Kansas City, Kans., succeeded E. H. Crofoot as City Manager of Mason City, Iowa, on August 19.

L. W. Sheckles, former manager of the municipal utilities, has become City Manager of Yoakum, Texas. He succeeds C. C. Crutchfield, who resigned to become joint field agent for the American Municipal Association and the League of Texas Municipalities.

Mark Trafton has succeeded Frank T. Adams as City Manager of Presque Isle, Maine.

CLARENCE E. RIDLEY,
Executive Director, The International City Managers' Association.

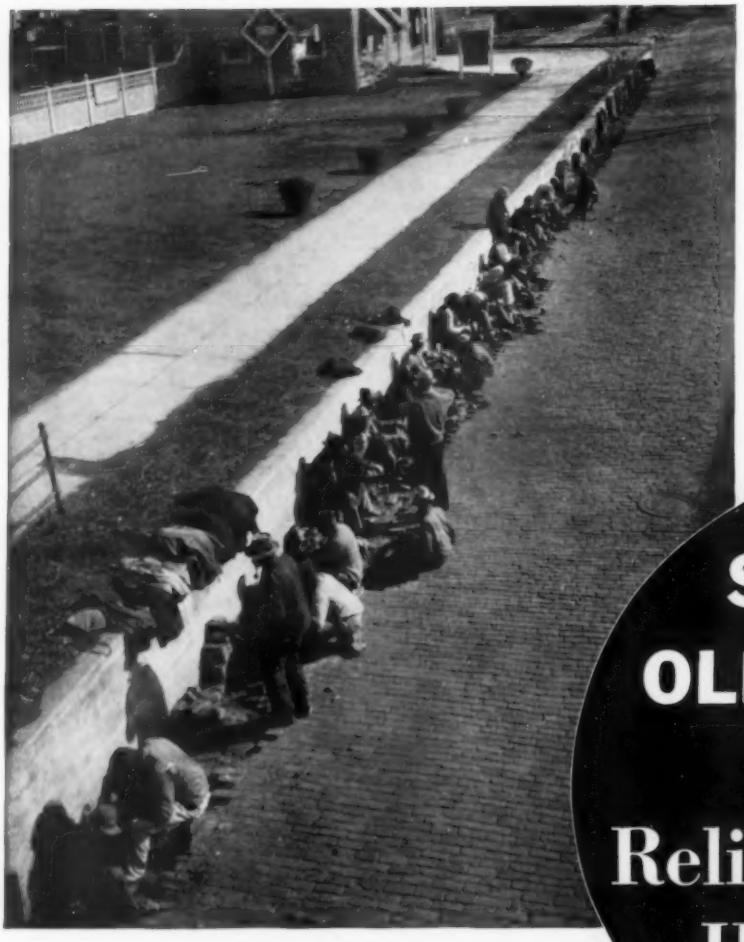
The Municipal Bond Market

THE exceptional opportunity now available for municipalities to issue new or refunding bonds at low interest rates is indicated by the lists of bond issues in *The Bond Buyer* last month.

Bond issues of less than $100,000 which sold on a yield basis of less than 2 per cent included: Beverly, Mass., 0.99; Richland Co., Wis., 1.59; Keene, N. Y., 1.77; Lynn, Mass., 1.92; and Clinton Co., Ind., 1.98.

Typical bond sales of $100,000 or over reported in August numbers of *The Bond Buyer* included:

Amount	Borrower and Purpose	Rate (%)	Term (Years)	Basis (%)
$100,000	Cambridge, Mass., Street	1.25	1-5 Ser.	1.15
320,000	Worcester, Mass., Relief	1.75	5.5 Avg.	1.60
137,000	Maplewood Tp., N. J., Public Improvement	2	3.16 Avg.	1.78
250,000	Wyandotte Co., Kans., Relief	2	1-10 Ser.	1.90
130,000	Goshen, Ind., Electric Utility Revenue	2.25	3.16	2.10
180,000	Minneapolis, Minn., Public Market	2.20	9.75	2.19
254,000	St. Paul, Minn., Sewer	2.25	18.33 Avg.	2.25
100,000	Calumet Co., Wis., Highway Improvement	3	12 Avg.	2.37
105,000	Oregon City, Ore., Refunding	2.75	5.8 Avg.	2.70
250,000	Penn Tp., Pa., School	3	1-20 Ser.	2.8
137,000	Salem, Ore., Refunding	2.5	5.75 Avg.	2.927
400,000	Kent Co., Del., Road	3	5.5 Avg.	2.96
5,500,000	Chicago, Ill., Board of Education Refunding	3.5	10.33-19.33 Op.	3.25
141,000	Sioux Falls, S. Dak., City Hall	4	20.75 Avg.	3.41
195,000	Petersburg, Va., Funding and General Improvement	3.5	30	3.56
920,450	Akron, Ohio, Refunding	4.5	5.25-9.76 Op.-Avg.	4.5
185,000	Dunmore, Pa., Judgment	5	12.8 Avg.	5



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Get lasting benefits from Work Relief Funds

HERE'S a practical way!

Use hand labor, simple tools and equipment available in any town.

Break up the brick or stone blocks from old, rough, bumpy streets and alleys—spread the salvaged aggregate over the old base—add additional stone where necessary to give required thickness—fill the voids with cement mortar grout.

This means a maximum amount of direct job labor—harmonizing with the Federal Work Relief Program.

The lasting result: a tangible and useful improvement—a Cement Bound Macadam pavement—smooth, durable, economical. Built by tried and proved methods.

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When you write for that catalog, kindly mention THE AMERICAN CITY

Water Rates and Service Charges, Installation Charges, Hydrant Rentals and Sprinkler Costs—XVII

Abstracts of Water Department and Company Reports

Fullerton, Calif.

Population	10,800
" served	9,000
Number of services	2,757
" " meters	2,757
" " hydrants	320
Miles of water main	50.8

The installation charge for a 5/8" by 3/4" meter is $23. For all other sizes the installation charge is based on time and material, with a deposit required in advance. The deposit for a 1" meter is $45, for a 1½" meter, $80, and for a 2" meter $120. On larger sizes the deposit is based upon an estimate furnished by the Water Superintendent's office.

The minimum charge for water is payable in advance by all consumers on all sizes of meters. This charge is $1.25, which entitles the consumer to 5,000 gals. of water. All water consumed in excess of 5,000 gals. is charged for at the rate of 10c per 1,000 gals.

A deposit of $2.50 is required of all persons not owning the property to which service is rendered.

The water bill becomes due when rendered, the first of every month; it becomes delinquent on the 15th of the month, and the service may be turned off if the bill is not paid by the 20th of the month in which the bill is rendered. A penalty of $1.00 is the charge for reconnecting services which have been discontinued for non-payment of the bill.

Free water is furnished for all municipal purposes.

GROVER L. WALTERS,
Superintendent, Fullerton Municipal Water Department.

Burlingame, Calif.

Population	14,000
" served	14,000
Number of services	4,400
" " meters	4,400
" " hydrants	275
Miles of water main	36.0

The schedule of water rates inside the city of Burlingame is as follows:

Between	0	and	15,000 gals.	@33c	per 1,000 gals.
"	15,000	"	30,000 "	@32c	" " "
"	30,000	"	50,000 "	@31c	" " "
Above	50,000 gals.			@30c	" " "

Minimum rate, $1.35 per ¾" meter per month

OUTSIDE THE CITY OF BURLINGAME

Between	0	and	25,000 gals.	@14c	per 1,000 gals.
"	25,000	"	50,000"	@39c	" " "
Above	50,000 gals.			37c	" " "

Minimum rate, $1.70 per ¾" meter per month

Taps and ¾" services are furnished for a uniform charge of $20.

There is no charge to the city for public fire hydrants, and private fire hydrants are metered.

H. W. SCHUCK,
Superintendent, Burlingame Municipal Water Works.

Shelbyville, Ind.

Population	10,000
" served	2,561
Number of services	Unknown
" " meters	2,517
" " hydrants	168
Miles of water main	22.3

The metered service rates filed with the Public Service Company of Indiana for services in Shelbyville, are as follows:

First	5,000	gals.	used per mo.	@ 25c	per 1,000 gals.
Next	5,000	"	" " "	@ 20c	" " "
"	10,000	"	" " "	@ 15c	" " "
"	30,000	"	" " "	@ 13c	" " "
"	50,000	"	" " "	@ 12c	" " "
"	150,000	"	" " "	@ 11c	" " "
"	250,000	"	" " "	@ 10c	" " "
"	500,000	"	" " "	@ 9c	" " "
Over	1,000,000	"	" " "	@ 8c	" " "

The monthly minimum charge, based on the size of the meter, is as follows:

1"	meter or less	$ .65 per meter
1½"	"	1.50 " "
2"	"	2.50 " "
3"	"	5.00 " "
4"	"	10.00 " "
6"	"	15.00 " "

Bills are rendered and due monthly. If paid within 15 days from the date of the bill, the net bill is paid. If not paid within 15 days of the bill, the gross bill, which includes a collection charge of 3 per cent of the first $3.00 of net billing plus a charge of 3 per cent of the next $300 of the net billing, is also due. When the 15th day falls on Sunday or any other legal holiday, the first business day thereafter is added to the 15-day period.

The services are all installed and owned by the consumers.

The rates for private or public fire hydrants are as follows:

Each public or private fire hydrant			$40.00 per year
"	1½"	fire line	30.00 " "
"	2"	"	40.00 " "
"	3"	"	62.50 " "
"	4"	"	82.50 " "
"	6"	"	124.00 " "

These charges are made in two equal semi-annual installments due January 1 and July 1 of each year. There is no collection charge added.

H. G. SHERRITT,
District Manager, Public Service Co. of Indiana, Shelbyville, Ind.

Norfolk, Va.

Population	130,000
" served	151,000
Number of services	32,573
" " meters	26,021
" " hydrants	1,473
Miles of water main	404.36

The water rates in Norfolk for metered consumers consist of a service charge and a consumption charge, the latter being divided into three classifications, depending upon the total consumption per quarter as follows:

(a) Consumers using 300,000 gals. or less per quarter pay 25c per 1,000 gals.: provided that the minimum charge per quarter is $1.00; and provided further that consumers residing beyond the corporate limits of the city of Norfolk using 300,000 gals. or less per quarter pay 40c per 1,000 gals., and a minimum charge per quarter of $2.00.

(b) Consumers (other than those residing outside the city limits) using over 300,000 gals. and not more than 1,200,000 gals. per quarter pay 25c per 1,000 gals. for the first 300,000 gals., and 15c per 1,000 gals. for all water consumed in excess of 300,000 gals.

(c) Consumers using water in excess of 1,200,000 gals. per quarter pay 25c per 1,000 gals. for the first 300,000 gals., 15c per 1,000 for the next 900,000 gals., and 8c per 1,000 gals. for all water consumed in excess of 1,200,000 gals. per quarter.

The service charge, which varies according to the size of meter, is as follows:

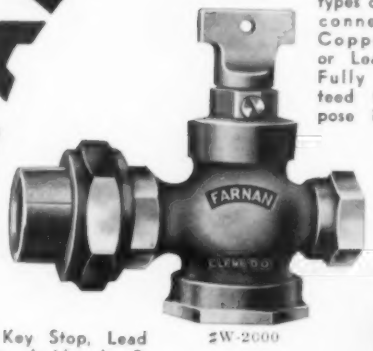
⅝"	meters	$ 6.00	per year or	$ 1.50 per quarter
¾"	"	8.00	" "	2.00 " "
1"	"	16.00	" "	4.00 " "
1½"	"	36.00	" "	9.00 " "
2"	"	50.00	" "	12.50 " "
3"	"	100.00	" "	25.00 " "
4"	"	180.00	" "	45.00 " "
6"	"	400.00	" "	100.00 " "
8"	"	800.00	" "	200.00 " "

Quarterly service and minimum charges are payable in advance. Any bill not paid when due is considered delinquent and leads to the shutting-off of water from the premises, and water is not turned on again until all arrears and charges have been paid, including $1.00 for turning on the water.

CHARLES H. BLIVEN,
Superintendent.

FARNAN BRASS

Remember the name when in market for Curb Stops, Inverted Key or Solid Tee Head, Couplings and Fittings for all types of service connections, Copper, Iron or Lead Pipe. Fully guaranteed for purpose intended.

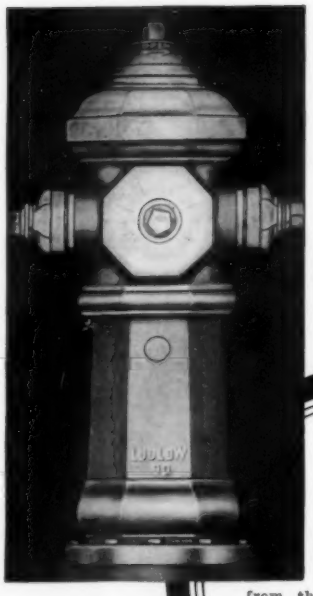


SW-2000

Inverted Key Stop, Lead Flange to Inside I. P. Threads cut to gauges. Key accurately ground assuring leak-proof stop.

Write us for samples and prices.

FARNAN BRASS WORKS CO.
CLEVELAND, OHIO
Established 1852



A MODERN HYDRANT

CHECK THESE POINTS!

No obstruction in water way. All working parts easily removed. Drains from the bottom. Eliminates surges and water hammer. Breaks *above* ground in case of accident. Can be replaced without digging. Beautiful outside symmetry.

The LUDLOW VALVE MFG. CO.
TROY, NEW YORK

O. K. CHAMPION POWER SEWER CLEANER

Automatic Level Cable Winder, Automatic Clutch Release. Extra Free-Wheeling Clutch, Auxiliary Cable Drum, Knee-Action Wheels, Modern Air-Wheel Tires, Zerk Lubrication, 7-Horsepower, 2-Cylinder Gas Engine. This Sewer Cleaner will give good satisfaction.

We build smaller units that have given good results in hundreds of cities in 40 states and Canada.

More than 25 years' sewer cleaner experience.

GET OUR LITERATURE AND PRICES, ADDRESS

CHAMPION CORPORATION
4716 SHEFFIELD AVENUE, HAMMOND, INDIANA

The EDDY Valve

The Eddy Valve has a number of distinctive features which it will pay you to study. For example, the gates are free to revolve on the trunnions, so as not always to seat in the same position.

Write us for further details

Also manufacturers of the well-known Eddy Hydrant

EDDY VALVE COMPANY

WATERFORD NEW YORK

Representatives

Jas. B. Clow & Sons, Chicago, Ill.
National Cast Iron Pipe Co., Birmingham, Ala.

Tiffin, Ohio

Population	17,000
" served	17,000
Number of services	3,944
" " meters	3,849
" " hydrants	244
Miles of water main	41.72

The schedule of domestic, commercial and industrial water service rates, with the minimum charges, which includes all charges for the furnishing of quantities of water set opposite the respective monthly or bi-monthly rates, are as follows:

MONTHLY RATE

First	333⅓ cu. ft. per mo.	@ 38c net per 100 cu. ft.
Next	2,777⅔ " " "	@ 32c " " " " "
"	4,333½ " " "	@ 24c " " " " "
Over	7,333 " " "	@ 10c " " " " "

BI-MONTHLY RATE

First	666⅔ cu. ft. per bi-mo.	@ 38c net per 100 cu. ft.
Next	5,334 " " "	@ 32c " " " " "
"	8,666 " " "	@ 24c " " " " "
Over	14,666 " " "	@ 10c " " " " "

MINIMUM CHARGE

Size of Meter	Min. Mo. Cu. Ft.	Minimum Mo. Charge	Minimum Bi-Mo. Cu. Ft.	Minimum Bi-Mo. Charge	Minimum Yearly Charge
⅝"	333⅓	$ 1.25	666⅔	$ 2.50	$15.00
1"	600	2.08	1,200	4.17	25.00
1½"	750	2.52	1,500	5.04	30.00
2"	950	3.15	1,900	6.30	36.00
3"	1,900	6.29	3,800	12.57	72.00
4"	2,900	9.42	5,800	18.85	110.00
6"	5,850	16.67	11,700	33.33	180.00

A charge of 2c per 100 cu. ft. is made on all bills not paid on or before the 10th of the month immediately following the period for which service is rendered.

All applications for the use of water are made in writing at the office of the Tiffin Water Works (private company) upon forms furnished for that purpose. All applicants who are not property owners must deposit with the Tiffin Water Works the sum of $5.00, or a greater amount if in the opinion of the Manager of the company a larger sum is necessary to equal his estimate of the average bi-monthly bill, unless security has been signed by some responsible property owner. This deposit is refunded on release of occupancy with interest of 6% per year. No contract for water is made for less than one year except for building purposes, and in cases where parties vacate the premises. In case of violations of any regulation by a consumer, or non-payment of rates within 10 days after they become due, his supply may be cut off, and the water is not turned on again until all causes of complaint have been removed and debts paid, with an additional charge of $2.00 for turning water on. Service pipes from the main to the inside of the curb line are installed by the water works, and the pipes and fittings are furnished by and remain the property of the water works. For installing each regulation ¾" service, the water works charges:

On paved and improved streets and alleys	$15.00
On unpaved thoroughfares	7.50

Service pipes from the curb line into premises or buildings are installed at the expense of the applicant, but no service pipes are installed in freezing weather. Service pipes must be installed 4.5 feet below the surface of the ground and on no other land than that on which the buildings supplied are located, and they must not be within 18 inches of a sewer.

The water works sets ⅝", ¾" and 1" meters at its own expense. This expense is construed to cover only the cost of inserting the meter in a straight line of pipe within the building to be supplied, and if the meter cannot be properly placed in the building, then the owner or his agent, or the consumer, must provide a suitable meter box of approved design at a point designated by the water works. The charges for testing meters alleged to be registering incorrectly are as follows:

⅝" to 1"	$ 2.00
1½" to 2"	4.00
3"	6.00
4"	9.00
6"	12.00

All water furnished for public use, except for fire protection and unstopping sewers, is furnished through metered services at the regular rates. Water for unstopping sewers is furnished at the rate of $4.00 per hour for an ordinary hose stream furnished through a 1-inch nozzle, or at the regular meter rate. Fire protection with the necessary water is furnished at the rate of $60.00 per hydrant, or $5.00 per hydrant per month, payable monthly, for all existing hydrants and for all future hydrants that may be ordered on extensions, one hydrant to every 600 feet of mains as provided by franchise ordinance. All fire hydrants that are ordered installed on existing mains are installed by the company and a rental paid by the city on the same terms as for other hydrants at the rate of $30.00 per hydrant per year, or $2.50 per hydrant per month, and payable monthly.

Connections for private fire protection and sprinkler systems are made when ordered by the City Council, which specifies the size of each connection. The cost of the connection and meter is paid by the applicant, and no domestic or industrial supply is permitted from the fire protection connection. The rates for various sizes of connections are as follows:

2"	5,000 sq. ft. or less	$10.00 per year
3"	10,000 " " "	20.00 " "
4"	20,000 " " "	30.00 " "
6"	30,000 " " "	50.00 " "

In addition, $1.00 per year is charged for each 1,000 square feet of additional floor space. Hydrants to be used for fire protection only in connection with sprinkler systems are charged at $20 per year. Hydrants to be used for fire only are billed $40 per year. Smaller fixtures than fire hydrants are charged for as area protected, the same as sprinkler systems. Bills are payable monthly or bi-monthly at the discretion of the General Manager.

C. H. WETTER,
General Manager, Tiffin Water Works.

Fargo, N. Dak.

Population	30,000
" served	28,500
Number of services	5,600
" " meters	5,600
" " hydrants	655
Miles of water main	63.5

The water rates in Fargo are as follows:

First	250,000 gals. in 30 days	15c per 1,000 gals.
Next	250,000 " " "	14c " " "
"	250,000 " " "	13c " " "
"	250,000 " " "	12c " " "

Balance at 10c per 1,000 gals.

A semi-annual service charge is made as follows:

⅝" meter	$ .60
¾" "	1.05
1" "	2.10
1½" "	3.30
2" "	5.40
3" "	7.50
4" "	10.50
6" "	16.50

There is a 10% discount on the meter rate and service charge if the bill is paid before the 10th of the month in which it is presented.

The city pays $20 per year for each hydrant for fire protection, and $24 per year for each hydrant installed for sewer flushing.

There are no sprinkler charges, the installation being governed by a building ordinance and the underwriters' requirements.

W. P. TARBELL,
City Engineer.

Battle Creek, Mich.

Population	49,000
" served	48,000
Number of services	14,000
" " meters	13,500
" " hydrants	998
Miles of water main	112.0

The rates for water within the corporate limits of the city of Battle Creek are as follows:

2,000 to	15,000 gals.	14c per 1,000
15,000 "	30,000 "	12c " "
30,000 "	300,000 "	11c " "
300,000 "	900,000 "	9c " "
Over	900,000 "	8c " "

The rates for services outside the city are:

1.8 to	15,000 gals.	21c per 1,000
15 "	30,000 "	18c " "
30 "	300,000 "	16½c " "
300 "	900,000 "	13½c " "
900 "	1,400,000 "	12c " "

Over 1,400,000—special rates

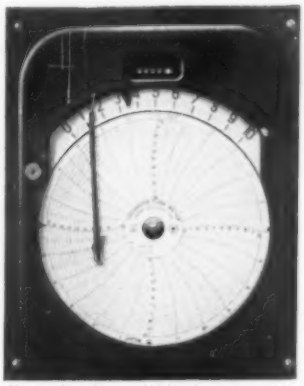
The minimum rate is 25c per month inside the city, and 37½c outside the city.

Every service except those receiving free water is metered.

The city water works has had no debts for nineteen years, all improvements being paid for out of surplus.

W. W. BRIGDEN,
Superintendent and Engineer.

COCHRANE FLOW METERS



Above is shown indicating, recording and integrating Electric Flow Meter

COCHRANE FLOW METERS whether Mechanical or Electrical, are distinguished by their exceptional accuracy. Such accuracy in an Electrical meter is unusual, when coupled with the ruggedness built into the Cochrane. The secret lies in the Galvanometer Null Principle, long recognized as the most accurate means of measuring a force or quantity, and now utilized for the first time in the measurement of fluid flow. Write for catalog.

COCHRANE CORP., Dept. AC-9, 17th & Clearfield St., Phila., Pa.

"Sump Suction"
AERO-MIX
AERATOR - MIXER
Patented

Discharge of Aer-O-Mix-Aerator-Mixer in outside basin.

Installations of Aer-O-Mix for aeration, chemical mixing or both may be made indoors or out-of-doors for **dependable all-weather operation.**

Gravity or motor driven units. Write for illustrated literature.

Vogt Mfg. Co., Inc.

Factory Mail Address: Box 1122, Louisville, Ky.

YOU NEED THIS *Modern* TURBINE PUMP!

●Why? Because it insures a clean, dependable water supply and cuts water costs to rock bottom! No oil or grease can get into the water to cause contamination. Deming Deep Well Turbine Pumps are water lubricated. Write today . . . NOW . . . for FREE illustrated bulletin. Save money with a Deming Deep Well Turbine!

THE DEMING COMPANY

18 BROADWAY • • SALEM, OHIO

PUMP MANUFACTURERS SINCE 1880

UNIFORM

Here are hundreds of bags of Permutit zeolite ready for delivery. Every granule in every bag is *uniformly* toughened for hard service because all Permutit zeolites are completely machine-processed through the stages of cleansing, sifting, classifying, and treating. That is why these zeolites (called Zeo-Dur and Super-Zeo-Dur) are the finest you can buy.

Let us send you full details on these and other zeolites. Ask for information about zeolite water softening for your community. No obligation, of course. Write The Permutit Company, 330 West 42nd Street, New York City.

Permutit
Water Conditioning Equipment

Wilmington, N. C.

Population	35,000
" served	37,500
Number of services	9,400
" " meters	4,500
" " hydrants	421
Miles of water main	60.0

A minimum charge of $3.00 per quarter is made to metered consumers, allowing them 1,500 cu. ft. of water. The charges for water used are:

0 to 1,500 cu. ft. per quarter	$ 3.00
1,500 " 2,000 " " " " at 18c per 100 cu. ft.	.90
2,000 " 3,000 " " " " " 17c " " " "	1.70
3,000 " 5,000 " " " " " 16c " " " "	3.20
5,000 " 10,000 " " " " " 15c " " " "	7.50
10,000 " 20,000 " " " " " 14c " " " "	14.00
20,000 " 50,000 " " " " " 12c " " " "	36.00
All in excess of 50,000 cu. ft. per quarter at 9c per cu. ft.	

Services are installed at actual cost of time and material, paid by the consumer. The city furnishes the meter and meter setting free. The service is perpetually maintained by the city at no cost to the consumer.

There is no charge to the city for the installation and maintenance of public fire hydrants.

Private fire protection rates are based on the value of the building protected, as follows:

$25 per year from	$ 00 up to and incl.	$50,000
50 " " "	$50,000 " " " "	100,000
75 " " "	$100,000 " " " "	200,000
100 " " "	$200,000 and up.	

M'KEAN MAFFITT,
Superintendent of Water and Sewers.

Auburn, N. Y.

Population	38,000
" served	40,000
Number of services	7,600
" " meters	7,500
" " hydrants	750
Miles of water main	75.0

The meter rates for water service in Auburn are net. 10% being added if the bills are not paid on or before the 10th of the month when due. The meter rates are:

First 1,000 cu. ft.	$1.30 per mo.	
Next 2,000 " " (3,000 incl.)	1.00 each per mo.	
" 5,000 " " (8,000 incl.)	.80 " " "	
" 10,000 " " (18,000 incl.)	.70 " " "	
" 20,000 " " (38,000 incl.)	.50 " " "	
All over 38,000 cu. ft.	.40 " " "	
Minimum rate each meter (500 cu. ft., or 3,739 gals., allowed)	.65 per mo.	

Bills for metered water are payable monthly except where water is furnished to domestic consumers, in which case bills are rendered quarterly. In the event that more than one meter is used for the same premises, separate bills are rendered for each meter reading.

Every person desiring a supply of water from the city mains must make application at the office of the Water Department for a service pipe and connection with the city's mains. All service connections with the mains to within approximately 2 feet back of the curb line or gutter line, including the stop or curb cock or valve and box, are installed only by employees of the Water Department. The consumer is charged the actual cost of all labor and material plus a reasonable per cent for overhead and use of tools, including also the repaving and maintenance of the roadway until restored to a condition equal to the existing roadbed before the excavation was made. Water Department employees also extend the service to the meter, which may be located either at the curb or within the cellar. A duly licensed plumber or person having a special permit from the Water Department may make this latter installation.

All street fire hydrants or hydrants for private fire protection from unmetered service lines are under the control of the Water Department. Standpipes and other pipes for automatic suppression of fires in buildings are permitted. At the option of the Water Department no charge is made for the use of water for extinguishing fires on private property, but all such pipes must be provided with a suitable valve outside the building, under the exclusive control of the Water Department. Also, in the case of standpipes, the valve must be placed at the bottom of the standpipe. Where such installations include long sections of pipe line underground or wherever directed by the Superintendent of the Water Department, detector check valves with metered by-pass connections are installed to determine unauthorized use or leakage. The entire cost of installing fire service is borne by the owner of the building supplied.

A. J. ADAMS,
Chief Engineer and Superintendent of Plant, Municipal Water Supply System.

Louisville, Ky.

Population	320,000
" served	330,000
Number of services	65,064
" " meters	47,864
" " hydrants	3,000
Miles of water main	678.0

The schedule of meter rates subject to a 20% discount is as follows:

353 gals. daily, or less, per day	$ 0.06
Over 353 up to and including the first 5,000 gals. daily, per 1,000 gals.	.17
Second 5,000 gals. daily, per 1,000 gals.	.16
Third " " " " " "	.15
Fourth " " " " " "	.14
Fifth " " " " " "	.13
Sixth " " " " " "	.12
Seventh " " " " " "	.11
Eighth " " " " " "	.10
Ninth " " " " " "	.09
Tenth " " " " " "	.08
All additional quantities " " "	.06

Applications for service from the mains of the Water Company must be made by the owner of the premises or by his duly authorized agent. The Superintendent or Chief Assessor of the Water Company issues a written permit granting the applicant the privilege of a service connection, which is installed by the company, without cost to the consumer, the applicant furnishing, laying and keeping in repair free of cost to the Water Company all service pipe within the property line. Fire protection services, elevator services and other occasional or temporary uses of water, and extraordinary services within the city limits, are paid for by the consumer by making a deposit of the estimated cost of the work in advance. No service attachments for water are installed free of cost outside the corporate limits of the city of Louisville.

There are no charges for public fire hydrants used for fire protection. Supply pipes for private fire protection, standpipes and automatic sprinklers are installed in sizes from 1" to 6" in diameter. The consumer agrees by contract not to take water from the hydrant for any purpose except preventing or extinguishing fires. The service pipe from the main in the street to the property line is laid and controlled by the Water Company at the property owner's expense. The charge for fire protection service, including sprinkler charges, is made in accordance with the following schedule and payable in semi-annual installments in advance on January and July 1 or April and October 1 of each year.

FIRE PROTECTION SERVICE COSTS

8" service, each per annum	$40.00
6" " " " "	25.00
4" " " " "	15.00
3" " " " "	10.00
2" " " " "	7.50
1½" " " " "	5.00
1¼" " " " "	4.00
1" " " " "	3.00

L. S. VANCE,
Principal Assistant Engineer, Louisville Water Co.

Stamford, Conn.

Population	56,532
" served	48,800
Number of services	8,460
" " meters	7,678
" " hydrants	638
Miles of water main	122.0

The water rates of the Stamford Water Co. were revised downward on July 1, 1932, and these rates are still in force, as follows:

First 300 cu. ft. per mo.	Minimum charge	
Next 4,700 " " " "	@ 30c per 100 cu. ft.	
" 10,000 " " " "	@ 24c " " " "	
" 20,000 " " " "	@ 18c " " " "	
" 465,000 " " " "	@ 10c " " " "	
Over 500,000 " " "	@ 8c " " " "	

MINIMUM CHARGE PER MONTH

⅜"	$ 1.00
¾"	1.50
1"	3.00
1½"	4.50
2"	6.00
3"	9.00
4"	15.00
6"	24.00

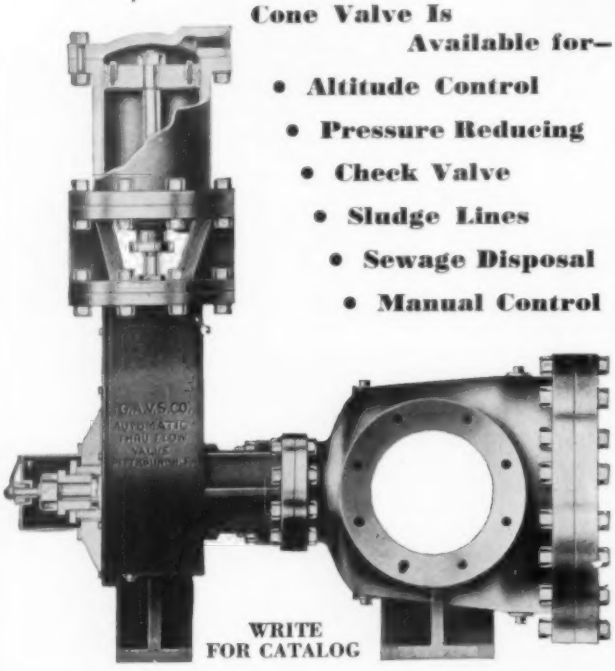
The rate for hydrants for public fire protection is $20 each per year.

For private fire protection the charges for supplying automatic sprinkler systems, connections for standpipes or other devices connected with the mains by direct line, used only for fire purposes, are:

1" service	$ 5.00 per year
1½" "	10.00 " "
2" "	20.00 " "
3" "	30.00 " "
4" "	50.00 " "
6" "	75.00 " "
8" "	100.00 " "

B. H. KEELER,
Superintendent, Stamford Water Co.

and now . . . . .
the "World's Best" Thru-Flow Cone Valve



Cone Valve Is Available for—

- **Altitude Control**
- **Pressure Reducing**
- **Check Valve**
- **Sludge Lines**
- **Sewage Disposal**
- **Manual Control**

WRITE FOR CATALOG

For more than 30 years Golden-Anderson has been known as the manufacturer of the "World's Best" Automatic Valves.

Now, Golden-Anderson offers you the supreme development in the Thru-Flow or Cone type Valves.

In the new Golden-Anderson Thru-Flow Valve the plug is unseated axially, rotated, and reseated axially, all in one free and frictionless operating movement and drop tight in either open or closed position; this is accomplished by means of a simple and sturdy patented toggle type rotor mechanism which is encased in a bath of oil in the operating head.

The valve itself is just as simple and sturdy, the full flow plug being stronger than pipe of the same area. And each unit—plug, valve body, operating head, and automatic control—is separate and distinct, designed so that any one unit may be removed from the line without disturbing other units.

The valve stem may be repacked under pressure. The operating head cylinder stem may be repacked without draining the oil bath.

There are no balance ports, grooves, or cams in the valve. There are no cams, no line contacts, no stem screws in the operating head.

The automatic control may be any one of the several patented mechanisms which have established Golden-Anderson as the manufacturer of the "World's Best" Automatic Valves.

If you want increased efficiency and unfailing automatic control, ask the Golden-Anderson Engineers for further details.

GOLDEN-ANDERSON VALVE SPECIALTY CO.
1329 Fulton Building Pittsburgh, Pennsylvania

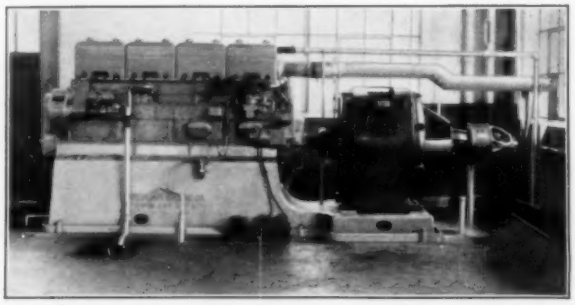
AN INDEPENDENT POWER PLANT

is supplied initially with current by this Sterling gasoline engine generator set. No outside power is used for starting. The plant is entirely self contained.

Sterling High Duty Internal Combustion Engines

21 to 565 B. H. P.
Gas or Gasoline

The generator set also furnishes all necessary electricity for lights, and utility over week-ends and holidays, enabling the shutting down of the steam plant and resulting in great savings in operation.



The Sunbury Converting Works, Belvidere, N. J., employs a Sterling Viking 11, 8-cylinder, 565-Hp. engine driving a 320-K.W. Westinghouse generator at 1200 R.P.M. Engineered by W. E. S. Dyer, C.E., Philadelphia.

Gas — Gasoline — Diesel Oil Engines

STERLING ENGINE COMPANY

Home Office and Plant
1270 Niagara St., BUFFALO, N. Y. Dept. C-11 *Branch Office* 900 Chrysler Bldg., NEW YORK, N. Y.

Concord, N. H.

Population	25,228
" served	24,000
Number of services	4,822
" " meters	3,993
" " hydrants (public)	601
(private)	112
Miles of water main	86.35

Meter rates are due and payable quarterly on the first day of January, April, July and October. The quarterly rates are:

First	1,500 cu. ft. or any part thereof	$ 2.50
Next	3,500 " " " " "	15c per 100 cu. ft.
"	5,000 " " " " "	14c " " " "
"	5,000 " " " " "	13c " " " "
"	5,000 " " " " "	11c " " " "
"	15,000 " " " " "	9c " " " "
"	300,000 " " " " "	8c " " " "
"	565,000 " " " " "	7c " " " "
1,000,000 cu. ft. to 3,000,000 cu. ft.		6c " " " "
All over 3,000,000 cu. ft.		4¾c " " " "

The minimum quarterly charge is $2.50.

Applications for water from the city mains are made at the Water Office on a special form. The service pipes are provided and maintained by the city from the mains to the side lines of the street. No service pipes are laid for any consumer whose water rates would be less than $4.00 per year. Every service pipe must be provided with a stop and waste cock on the inside of the cellar or foundation wall and near where the pipe passes through the wall; it must be easily accessible and fully protected from freezing; and all pipes in buildings must be laid in such a way that they can be fully drained by the waste. When different families or tenants are supplied with water in the same building, a suitable stop and waste cock must be provided for each. Only one meter is set by the Water Commissioners on any premises, and the owner of the premises must pay the rates for the entire amount used upon those premises, irrespective of underleases or individual consumers.

There is no charge for public fire hydrants. Private hydrants to be used only in case of fire also carry no rental charge.

P. R. Sanders,
Superintendent, Concord Water Works.

Burlington, Iowa

Population	26,755
" served	26,000
Number of services	7,344
" " meters	561
" " hydrants	761
Miles of water main	77.43

The meter rates for water services in Burlington are as follows:

First	10,000 gals. per mo.	30c per 1,000 gals.
Second	10,000 " " "	25c " " "
Third	10,000 " " "	20c " " "
Fourth	10,000 " " "	15c " " "
Fifth	10,000 " " "	12½c " " "
Additional		10c " " "

The minimum charge is $1.00 per month. There are no meter rental charges and no discounts for prompt payment.

The Water Company furnishes the material, and installs and owns all services, except sprinkler services, which are laid from the street main to the curb box back of the street curbing. A $20 deposit is required when blind services are requested for vacant lots. This deposit applies to water rates when the party becomes an actual consumer. No deposit is required when the party requesting the service becomes an actual consumer upon the completion of the installation. Consumers are required to use extra-heavy galvanized or copper service pipe, to be laid 5′ 6″ below the ground level from the Water Company curb box to the consumer's basement. The ditch must be left open for inspection by the Water Company before backfilling.

A 5-mill tax (0.005c) is assessed and paid to the Water Company by the city of Burlington for rental on public fire hydrants and for water used for flushing sewers and for street cleaning. Services for automatic sprinklers are laid at the expense of the party making the installation, by the Water Company. The annual service charge is $24 per year without respect to the number of sprinkler heads installed. There are only five private fire hydrants in the city for which no charge is being made at the present time.

Mark E. Driftmier,
Citizens' Water Co.

Columbus, Ga.

Population	43,000
" served	50,000
Number of services	8,500
" " meters	6,400
" " hydrants	630
Miles of water main	80.0

The schedule of water rates in Columbus varies according to the average daily consumption in any month and is different for consumers within the corporate limits and outside the city.

In the City

5,000 gals. or less		15c per 1,000 gals.
5,000 " " " than	10,000 gals.	14c " " "
10,000 " " " "	15,000 "	12c " " "
15,000 " " " "	200,000 "	10c " " "
200,000 " or more		9c " " "

Minimum charge of $3.00 per quarter (equivalent to 20,000 gals.)

Outside the City

500 gals. to 1,000 gals.		20c per 1,000 gals.
1,000 " or less than	5,000 gals.	16c " " "
5,000 " " " "	10,000 "	14c " " "
10,000 " " " "	15,000 "	12c " " "
15,000 " " " "	200,000 "	10c " " "
200,000 " or more		9c " " "

Minimum charge of $3.00 per quarter (equivalent to 15,000 gals.)

A charge of $25.00 each per year is made for public and private fire hydrants, and a charge of 5c per head, with a minimum of $32.50 per year, is made for sprinklers for private fire protection.

C. F. Jordan,
Superintendent, Columbus Water Works.

Ironwood, Mich.

Population	14,299
" served	14,299
Number of services	3,090
" " meters	3,081
" " hydrants	363
Miles of water main	47.37

The water meter rates charged by the Water Department of the city of Ironwood are as follows:

First	2,500 cu. ft.	20c per 100 cu. ft.
All over	2,500 " "	8c " " " "

There is no service charge, and the minimum charge is 35c per month.

The cost of installing services, for which all of the work is done by the Water Department, is as follows:

¾″	service connection	$23.00
¾″	" in sewer ditch	18.00
1″	"	22.00
1″	" in sewer ditch	27.00

The city pays $90 per year per hydrant for fire service and $300 per year for water used for street sprinkling.

J. E. Sahlin,
Superintendent, Ironwood Water Department.

Athol, Mass.

Population	10,622
" served	9,950
Number of services (active)	1,862
" " meters	1,788
" " hydrants (private, 2)	192
Miles of water main	36.18

There are two sets of rates in force in Athol, Mass., domestic meter rates and manufacturers' rates. The rate for domestic service is $3.00 per quarter, minimum charge, which allows the use of 800 cu. ft. of water without additional charge. For all water used over 800 cu. ft., the charge is 30c per 100 cu. ft. Manufacturers' rates are:

First 10,000 cu. ft.	18c per 100 cu. ft.
Over 10,000 " "	10c " " " "

The annual minimum charge depends upon the size of meters as follows:

Up to and including 1″	$20.00
" " " 2″	26.00
" " " 3″	30.00
" " " 4″	80.00
" " " 6″	160.00

Domestic meters are billed quarterly and manufacturers' meters are billed monthly. All meter rates are payable 10 days after the date of billing, and if not paid within 10 days after they are due, the water may be shut off without further notice. No discount is made for vacant premises unless the water is shut off by an agent of the Department, and then only if premises have been sealed for two months or more.

The hydrant rental is $3,000 per year for 171 hydrants. There is no charge for private hydrants and no charge for sprinkler systems for private fire protection.

All services are installed at actual cost plus 15%. The service is installed from the main to the inside of the cellar wall of the property.

Frank P. Hall,
Superintendent, Athol Water Department.

L.F.C.

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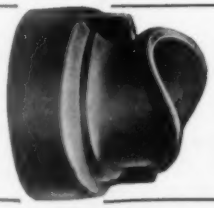

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Hartford, Conn.

Population (1930 U. S. census)	212,630
" served	213,000*
Number of services	27,116
" " meters	26,450
" " hydrants	3,158
Miles of water main	422.1

The entire supply of the Hartford County Metropolitan District water to any and all premises, except where used for fire protection exclusively, is furnished by meter only and at the following prescribed rates within the District:

Firt 3,000 cu. ft. or less per day, 15c per 100 cu. ft.
All over the first 3,000 cu. ft. per day, 7½c per 100 cu. ft.

An annual minium charge is made which includes the charge for water used at the established rate up to the amount of the minimum charge. These charges are according to the size of meter, as follows:

⅝" meter	$ 6.00
¾" "	7.50
1" "	10.50
1½" "	18.00
2" "	30.00
3" "	60.00
4" "	90.00
6" "	180.00

For all communities taking water from the Metropolitan District Water Supply System that are not entitled by law to receive water at the regular rates established for consumers in the city of Hartford, the rates are as follows:

First 3,000 cu. ft. or less per day, 15c per 100 cu. ft.
All over the first 3,000 cu. ft. per day, 9c per 100 cu. ft.

In addition to the charge for water for all meters owned and operated by the Metropolitan District, including billing and collecting, in the community, the following annual service charge is made:

⅝" meter	$ 5.00
¾" "	6.50
1" "	8.50
1½" "	14.50
2" "	22.00
3" "	45.00
4" "	70.00
6" "	135.00
8" "	225.00
10" "	390.00

Water bills are rendered to the owner of the property supplied and become due semi-annually, except in the case of meters 2" or larger in size, for which water bills are rendered monthly. Any claim or debt due for charges for the use of water constitute a lien upon the lot, house, tenement or premises. Five per cent is added to all water bills unpaid 20 days after due, and an additional 1% is added on the first day of each month thereafter until paid. The Bureau reserves the right to shut off water from premises where the bill remains unpaid 20 days after the date on which the bill is due. Whenever the water is turned off under such conditions, it is not turned on again without payment of all charges due, including interest and a fee of $2.00 for turning on the water, or until such arrangements for payment satisfactory to the Water Bureau have been made. Water which has been turned off for non-payment of water bills is not turned on again in services not equipped with curb cocks until a payment of $10.00 is made for the installation of such a curb cock in addition to the regular $2.00 fee for turning on the water.

Application for the installation of new services and the renewal of old services must be made by the owner of the property at the office of the Water Bureau, and all charges must be paid in advance at the time of making application. Service pipes are installed by the Water Bureau from the main to the street line only. New service pipes and the renewal of old service pipes require the same procedure and take the same charges, which are as follows:

Size of Pipe	In Improved Pavement	In Other Locations
1"	$75.00	$45.00
1½"	90.00	60.00
2"	105.00	75.00
4"	280.00	250.00
6"	360.00	330.00
8"	450.00	410.00

Whenever a public hydrant connection is requested by proper authority, the order is complied with by the Metropolitan District on payment of $175 as a "connection charge" for an original hydrant installation. This charge covers a standard connection 6" in diameter to the water main of the Commission, a connecting pipe with proper gates and other appurtenances 6" in diameter and of cast iron from the water main to the location of the hydrant designated by the proper authority in the sidewalk area back of the curb or in similar location, and a standard compression type hydrant equipped with two 2½" hose outlets and one 4½" steamer connection, with National Standard threads. All hydrants and their connections, when installed, are a part of the plant of the Metropolitan District Water Supply System, which maintains them subject to an annual charge of $5.00 paid by the requesting authority. Non-payment of the annual maintenance charge after due notice 30 days in advance, is considered sufficient authority for the Water Bureau to discontinue service at all hydrants where such payment is in arrears.

CALEB MILLS SAVILLE,
Manager and Chief Engineer, The Metropolitan District Commission of Hartford County.

* Includes consumers in Hartford, West Hartford, Windsor, Bloomfield, Newington, Wethersfield and Rocky Hill, Conn.

Marion, Ind.

Population	25,000
" served	30,000
Number of services	6,000
" " meters	5,865
" " hydrants	575
Miles of water main	63.0

The schedule of meter rates in Marion is as follows:

First	6,000	gals.	per	quarter	used	25c	per	1,000 gals.
Next	9,000	"	"	"	"	20c	"	"
"	30,000	"	"	"	"	15c	"	"
"	30,000	"	"	"	"	11½c	"	"
Over	75,000	"	"	"	"	8c	"	"

A discount of 5% is given on all water rents by metered service provided they are paid on or before the 15th of the month following the reading of the meter.

The minimum return from any meter per quarter, which is not subject to discount, is based on the size of the meter, as follows:

⅝" meter	$2.25 per quarter
¾" "	3.00 " "
1" "	5.00 " "
1½" "	6.00 " "
2" "	9.00 " "
3" "	15.00 " "
4" "	21.00 " "
6" "	30.00 " "

Consumers of city water outside the corporation limits pay 25% more than the regular rates.

The rents by meter service are due and payable at the end of each quarter, March 31, June 30, September 30 and December 31, of each year, and if not paid by the 15th of the month following the end of each quarter, the service is withheld until all back water rents have been paid.

The city pays to the Marion City Water Works the sum of $40 per year for each fire hydrant. This is not subject to discount. For the past three years collections have not been made on fire hydrant rentals.

S. M. VANCLEAVE,
Superintendent, Marion City Water Works.

Blue Island, Ill.

Population	16,500
" served	16,600
Number of services (active)	3,450
" " meters	3,500
" " hydrants	450
Miles of water main	40.0

The water rates at Blue Island, Ill., are:

First	10,000	gals.				21c	per	1,000 gals.
Next	90,000	"				19c	"	"
"	150,000	"	"	"	"	17c	"	"
"	250,000	"				15c	"	"
"	500,000	"				14c	"	"
All over	1,000,000	"				10c	"	"

Schools and hospitals pay a uniform charge of 10c per 1,000 gallons for all water used, with no discount.

The minimum monthly charge, which is based on the size of the meter, permits the use of a certain amount of water without additional cost to the consumer. The minimum rates are:

¾" meter	50 per month
1" "	2.00 " "
1½" "	3.00 " "
2" "	4.00 " "
3" "	7.50 " "
4" "	10.00 " "
6" "	15.00 " "

There is a flat charge of $2.50 for setting a meter on a service. The consumer pays the cost of a ¾" extra-heavy lead service from the water main to the meter in the house.

There is no discount allowed on minimum bills, but a 10% discount is allowed on the gross bill if paid within 10 days of mailing. If the bills are not paid within 30 days from their date, the water is shut off without further notice.

P. B. HAMMOND,
Superintendent, Bureau of Water.

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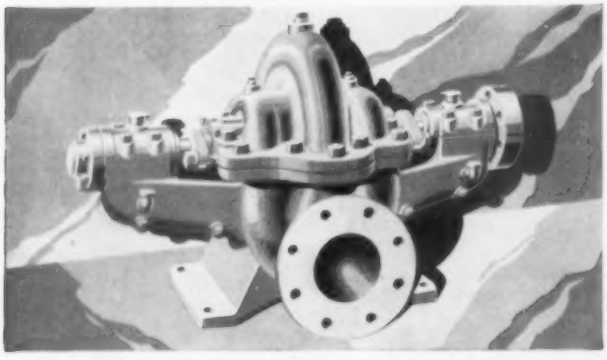

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Prepared by
FRANK B. WILLIAMS
Author of "The Law of
City Planning and Zoning"

ZONING and PLANNING NOTES

From Data collected
by the Zoning Committee
of New York
(233 Broadway)

Zoning—Interim Ordinance—Board of Appeals

MISSOURI.—*State ex rel. Kramer v. Schwartz*, 82 S. W. (2d) 63 (Supreme Court, Division No. 1, April 17, 1935). This is a proceeding in mandamus to compel Schwartz, the Building Inspector of Jefferson City, Mo., to issue to Kramer a building permit authorizing him to erect a store building on a lot in the city owned by him, and which the Building Inspector refused to issue because the erection of such a building in that locality was contrary to the zoning ordinances of the city, numbers 3268 and 3314.

Ordinance No. 3268 provides for the creation of a City Planning and Zoning Commission. The Commission has been appointed by the Mayor, as authorized by the ordinance, and has prepared a tentative zoning ordinance, which is ordinance No. 3314, mentioned above.

Ordinance No. 3314, designated as Interim Zoning Ordinance, in its preamble recites that the city has appointed a City Planning and Zoning Commission, which is "now working toward the completion of a permanent zoning ordinance"; that a zoning plan "as contemplated by the Act of 1925" (the State Zoning Enabling Act) "cannot be made in a few days but will require months" and "that the City Council of Jefferson City, recognizing that the City Planning and Zoning Commission can do little good if property owners are allowed to change conditions after the necessary information and data have been obtained, and desiring to maintain the status quo of conditions while the City Planning and Zoning Commission is gathering data and information to be used as the basis of its report to the City Council towards the enactment of a permanent zoning ordinance," has passed this so-called Interim Ordinance.

The ordinance then proceeds to provide that wherever less than twenty per cent of the frontage of one side of a street between two intersecting streets is occupied at the time of the passage of this ordinance by buildings used for commercial or industrial purposes, no additional premises or property shall be dedicated to or used for commercial or industrial purposes, or altered or enlarged for any such purposes.

Provided that where there are practical difficulties or unnecessary hardships in the way of carrying out the strict letter of this ordinance, the City Council may, upon written application for a building permit made to it, and after report from the City Planning and Zoning Commission, vary the application of these regulations with relation to a particular building or piece of land, so that the spirit of the ordinance shall be observed, and substantial justice done.

It is the duty of its Building Inspector, upon receipt of an application for a building permit required by the ordinances of the city heretofore passed, to investigate and ascertain if any provision of this ordinance would be violated by its issuance; and if his investigation shows such a violation, to report the same to the City Planning and Zoning Commission and the City Council.

Penalties are provided, and the ordinance shall be in force "from and after its passage and approval."

After Kramer had filed his application for the building permit in question, the Building Inspector made investigation and found that the lot on which the proposed building was to be erected is in a residence block in which less than twenty per cent of the frontage on that side of the street is used for other than residential purposes. To summarize the opinion:

Jefferson City has no inherent power to pass zoning ordinances; its only right so to do is the State Enabling Act of 1925, above referred to. That act provides that no such regulation shall be effective until after a public hearing on at least fifteen days' public notice; that the City Council, in order to avail itself of the powers of the act, shall appoint a Zoning Commission to recommend the terms of the ordinance. Such Commission shall make a preliminary report and hold public hearings thereon before submitting its final report, and the City Council shall not hold its public hearings or take action until it has received the final report of the Zoning Commission; and that the Common Council shall provide for the appointment of a Board of Adjustment of five members who shall be freeholders, to hear appeals and grant variances from the strict letter of the ordinance in cases of practical difficulty or unnecessary hardships.

The Enabling Act of 1925 is the measure of the power of Jefferson City to pass a valid zoning ordinance. That act is a grant of a portion of the state's police power, and the extent of the powers granted as well as the manner of their exercise must conform to the terms of the grant. The City Council, therefore, cannot pass a valid zoning ordinance until it has received the final report of the Zoning Commission or held a public hearing thereon. Furthermore, the provisions of the Enabling Act requiring the City Council to appoint a Board of Adjustment of five freeholders, with the powers specified in the act, are mandatory. Both these provisions are material and substantial requirements intended to safeguard the property owner, the public and the municipality against the injustice, error and precipitate or ill-advised action by local legislative or administrative officers; both are mandatory, and compliance with both is essential to the validity of any zoning ordinance, whether denominated "interim" or permanent.

The so-called Interim Ordinance did not, in terms or manner of passage, comply with either of these provisions and is therefore invalid.

It is urged that this "Interim Ordinance" was merely intended as a temporary or emergency measure to preserve the status quo until a permanent ordinance could be passed after the Zoning Commission had completed its investigation and secured the data and information to be used as the basis of a report to the Common Council looking to the enactment of a permanent zoning ordinance. It is said that if property owners are allowed to change conditions while the survey and investigation of the Zoning Commission is in progress, and before it is completed, that the purpose of the permanent zoning ordinance might be to some extent defeated or rendered ineffectual. These contentions carry the implicit assumption that, in the case of a temporary or emergency ordinance, the clearly expressed and mandatory provisions of the Enabling Act may be disregarded or relaxed to meet what is said to be the practical exigencies of the situation. But all ordinances passed pursuant to the Enabling Act, creating zoned districts and regulating the use of buildings or land within the districts so created, must be regarded as zoning ordinances. All such ordinances, whether called "interim," temporary or permanent, must comply with the substantial and mandatory provisions of the Enabling Act. That act must be construed and applied by courts like any other statute conferring police powers upon a municipality, and its clearly expressed and mandatory provisions cannot properly be abrogated, ignored or relaxed to meet the real or supposed practical needs of the municipality or its inhabitants. If these provisions are too rigid or stringent to meet the practical needs of the municipality or its people, the defects should be remedied by the State Legislature, and cannot be cured by the courts.

The city further contends that Kramer was not entitled to a writ of mandamus, because prior to applying for it he had not exhausted his remedies under the Interim Ordinance, in that he failed to apply to the City Council to vary or modify its application as he was entitled to do under the terms of the ordinance. But as that ordinance was void, it was not necessary for Kramer to follow or invoke any of the provisions of the purported ordinance.

EDITOR'S NOTE.—In accord with the foregoing decision, with regard to the mandatory character of the provisions in a State Enabling Act affecting the appointment of a Board of Appeals, is the New Jersey case of *Somers v. Borough of Bradley Beach*, 178 *Atl.* 755, reported in our Notes for August, 1935.

Board of Appeals—Garage—Practical Difficulties and Unnecessary Hardship

NEW YORK.—*Matter of Cohen*, Supreme Court, reported in *New York Law Journal*, May 11, 1935. The petitioner Cohen applied to the Board of Standards and Appeals for leave to erect on his property a one-story office and greasing room structure, and also the necessary tanks and pumps for a gasoline service station. Cohen's lot is situated in a business district where garages cannot be erected without a permit from the Board of Standards and Appeals.

The street in which the lot is located is a well-used automobile highway. The neighborhood is unimproved except for two gasoline service stations. The petitioner is unable at present to devote his property to a conforming use; nor is there any prospect of a change of conditions in the near future.

The Board of Standards and Appeals found that there were enough gasoline stations in the neighborhood to take care of the needs of automobiles; and that a variance allowing Cohen to erect such a station would injure existing stations.

The Couht overrules the Board of Standard and Appeals, and allows Cohen to erect his service station. A variance will not be allowed if it unjustly injures other property owners; but there seems to be no justification for withholding relief merely for the purpose of avoiding competition with non-conforming users.

EDITOR'S NOTE.—To the same effect is the New York case of *Young Women's Hebrew Association v. Board of Standards and Appeals*, reviewed in our Notes for May, 1935.

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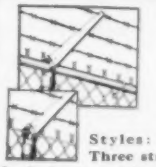

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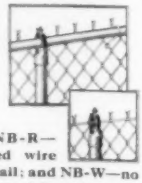

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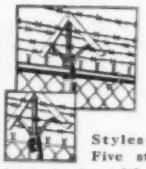

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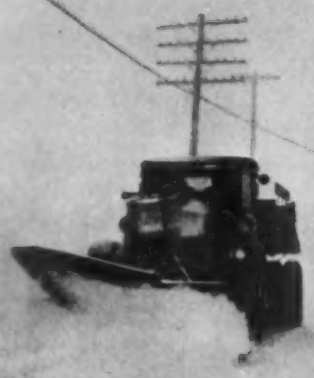

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THE CITY'S LEGAL RIGHTS AND DUTIES

Conducted by A. L. H. STREET, Attorney at Law

Accidents

Two-inch rise of cellar door lip in sidewalk, causing pedestrian to trip, held actionable defect (New York Supreme Court, Appellate Division: *Newhall v. McCann*, 275 N. Y. Supp. 222).

City's liability to employee for injury due to his being furnished unsuitable hammer for breaking rock held dependent upon lack of reasonable care to provide suitable tools (Springfield, Mo., Court of Appeals: *Choate v. City of Springfield*, 74 S. W. 2d, 869).

Insufficient repair of sidewalk defect by volunteer held not to exonerate city from constructive notice of any dangerous condition existing (Kentucky Court of Appeals: *City of Paducah v. McManus*, 76 S. W. 2d. 254).

That Water Committee furnished free water for playground shower-baths held not to render it or Council liable for injury to pedestrian stumbling over hose laid across sidewalk (Kentucky Court of Appeals: *Board of Council of City of Danville v. Vanarsdale*, 76 S. W. 2d. 237).

Bond Issues

Despite six years delay after authorization by voters, city held empowered to issue bonds for fire station (Kansas Supreme Court: *State v. City of Topeka*, 41 Pac. 2d, 260).

City, as trustee for holders of assessment bonds, held entitled to sue treasurer's surety for misappropriation of assessment funds paid to treasurer (California District Court of Appeal: *Municipal Bond Co. v. City of Riverside*, 41 Pac. 2d, 215).

Contracts

Contract for municipal electric plant, reserving title or lien until payment, upheld (Kentucky Court of Appeals: *Kentucky Utilities Co. v. City of Paris*, 75 S. W. 2d, 1082).

Liability of municipality for reasonable value of labor and materials furnished under illegal contract performed in good faith recognized (Florida Supreme Court: *Moore v. Spanish River Land Co.*, 159 So. 673).

Drainage

City held not liable for overflow of drains upon private property due to extraordinary rainfall (Kentucky Court of Appeals: *Board of Trustees of Town of Auburn v. Chyle*, 75 S. W. 2d. 1039).

Licenses

Perth Amboy Health Department held to have improperly refused to issue permit for sale of milk on ground that enough dealers were operating, etc. (New Jersey Supreme Court: *Sheffield Farms Co. v. Seaman*, 177 Atl. 372).

Official Salaries

Mayor's absence from post for eight months through illness held not to forfeit salary (Oklahoma Supreme Court: *Webb v. City of Hugo*, 37 Pac. 2d. 621).

City Treasurer held not entitled to extra compensation for keeping street improvement assessment accounts (Georgia Court of Appeals: *Mitchell v. City of Thomasville*, 178 S. E. 161).

Pensions

Board's refusal to allow policeman's widow a pension held not judicially reviewable (Kentucky Court of Appeals: *Rohe v. City of Covington*, 73 S. W. 2d. 19).

Process Service

Jurisdiction of city held not secured by leaving copy of summons, etc., at window in Corporation Counsel's office, no one being present (New York Supreme Court, Appellate Division: *Landsberg v. City of New York*, 277 N. Y. Supp. 533).

Public Utilities

Company furnishing electricity to city for distribution held entitled to assume that city maintained proper equipment, as affecting company's liability for death caused by live wire (Alabama Supreme Court: *Johnson v. Alabama Power Co.*, 159 So. 695).

Commission order reducing electric rates 10 per cent because of consumers' poverty held void as being confiscatory (United States District Court, District of Utah: *Telluride Power Co. v. Public Utilities Commission of Utah*, 8 Fed. Supp. 341).

Recall

Mayor and Council held subject to mandamus to compel calling of election to recall officials, petition, etc., being sufficient (California District Court of Appeal: *Muehleisen v. Forward*, 36 Pac. 2d, 141).

Sewage Disposal

City financially unable to immediately construct purification plant held not subject to injunction against discharge of raw sewage into stream from which another town gets water supply, no immediate menace to the water supply appearing, but city must comply with statutory prohibition against such discharge without unreasonable delay (North Carolina Supreme Court: *Town of Smithfield v. City of Raleigh*, 178 S. E. 114).

Special Assessments

Lot held assessable for sewer only as to part abutting upon improvement, although whole lot was benefited (Kentucky Court of Appeals: *City of Paintsville v. Wells*, 73 S. W. 2d. 20).

Holders of special assessment bonds held entitled to compel city to enforce collection of assessments and pay any unpaid balance on bonds (Kentucky Court of Appeals: *City of Prestonburg v. People's State Bank of Frankfort*, 72 S. W. 2d. 1043).

Street Improvements

Railroad right-of-way held assessable for street improvement (Oklahoma Supreme Court: *St. Louis-San Francisco Railway Co. v. City of Tulsa*, 41 Pac. 2d. 116).

Property in assessment district held specially benefited and subject to assessment for street improvement constituting part of arterial highway, although property had been previously assessed for three other streets (Washington Supreme Court: *In re Aurora Avenue in City of Seattle*, 41 Pac. 2d, 143).

Streets

Heirs of subdivider of land in city held not entitled to ground vacated as street on theory that the city held title on condition that ground be used for street purposes (California Supreme Court: *Gramer v. City of Sacramento*, 41 Pac. 2d. 543).

City held not liable for loss of profits of business due to temporary closing of street in making public improvement (Oklahoma Supreme Court: *Oldfield v. City of Tulsa*, 41 Pac. 2d. 71).

Taxation

Building used as residence for teaching staff of parochial school held tax-exempt as being "used for religious or educational purposes" (New York Supreme Court, Appellate Division: *St. Barbara's Roman Catholic Church v. City of New York*, 277 N. Y. Supp. 538).

Lands of cemetery association acquired for convenient transaction of business but not used for cemetery purposes held not tax-exempt (New York Supreme Court, Appellate Division: Springfield, L. I., *Cemetery Society v. City of New York*, 277 N. Y. Supp. 532).

Convent used for school teachers held exempt from taxation as devoted to school purposes (Pennsylvania Court of Common Pleas, Berks Couty: *Dougherty v. Neidig*, 26 Pa. Mun. Law Rep. 153).

Indiana statute exempting from taxation Kentucky municipality's bridge across the Ohio River held constitutional (United States Circuit Court of Appeals, Seventh Circuit: *City of Louisville v. Babb*, 75 Fed. 2d, 162).

Taxicab Regulation

Ordinance requiring taxicab operators to furnish bond or liability insurance upheld; injunction held proper remedy to prevent operation in violation of such requirement (Alabama Supreme Court: *Farrell v. City of Mobile*, 156 So. 635).

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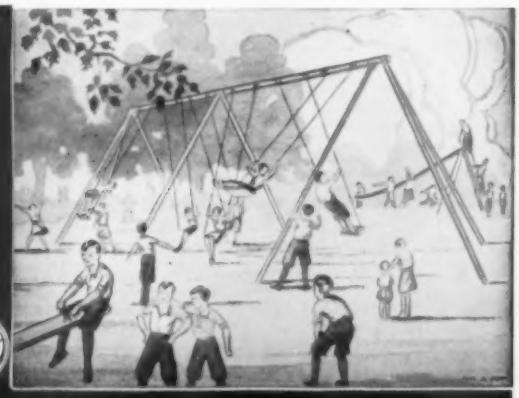

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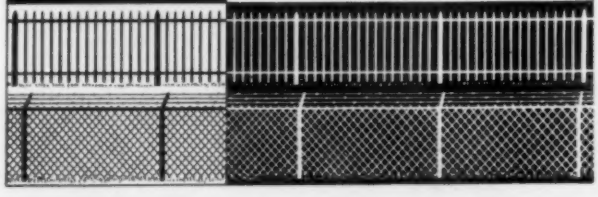

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Financial Statistics

The Bureau of the Census, U. S. Department of Commerce, has issued (1934) "Financial Statistics of Cities Having a Population of Over 100,000," showing for the fiscal year 1932 the financial transactions of the 94 cities of the population stated, the assessed valuation of the taxable property in those cities, the amount of taxes levied thereon for the fiscal year reported, and specified assets at the close of that year. 203 pp. 75c.

The Bureau has also issued (1935) "Financial Statistics of State and Local Governments: 1932," showing revenue receipts, governmental-cost payments, public debt, assessed valuations, and tax levies for the government of the states, counties, cities, towns, villages and boroughs, school districts, townships, and other civil divisions. 2,009 pp. $2.50.

Prepared under the supervision of Starke M. Grogan, Chief Statistician for Financial Statistics of States and Cities. (Apply to Superintendent of Documents, Washington, D. C.)

Municipal Administration

Thirteen authorities—in the fields of municipal finance, municipal personnel, city planning, public welfare, parks and recreation, public health, housing, police service, public works, fire service, municipal utilities, public schools, and public libraries—have appraised the good effects (see page 73 of this issue), and the bad effects of the depression as experienced by cities. This discussion is published by The International City Managers' Association in a pamphlet of 57 pages. The chapters appeared originally in *Public Management* in 1934 and early 1935. Despite the losses and defeats, it is shown that there has been a gain in civic spirit and ingenuity which has benefited city administration. $1.00. (Apply to the Association, 850 E. 58th St., Chicago, Ill.)

Population

Two studies of population redistribution have been issued by the University of Pennsylvania Press: Bulletin Number One (1934), "Internal Migration in the United States," by C. Warren Thornwaite, Assistant Professor of Geography, University of Oklahoma, assisted by Helen I. Slentz, Department of Social Science, Sapulpa Junior College, with a Preface by Carter Goodrich, Professor of Economics, Columbia University, 52 pp., illustrated with maps and graphs by the authors; Bulletin Number Two (1935), "Migration and Planes of Living, 1920-1934," by Carter Goodrich, Bushrod W. Allin and Marion Hayes, 111 pp., illustrated with maps by C. Warren Thornwaite and Helen I. Slentz, $1.00 each. (Apply to University of Pennsylvania Press, Philadelphia, Pa.)

Street Traffic Bibliography

The Bureau for Street Traffic Research, Harvard University, Cambridge, Mass., now has available for free distribution a limited number of copies of its Street Traffic Bibliography. This "selected and annotated bibliography of the literature of street traffic control and related subjects 1920-1933," issued in mimeographed form early in 1934, originally sold for $2, but readers of THE AMERICAN CITY are now invited to send for a complimentary copy. "A bibliography," says Dr. Miller McClintock, under whose direction the compilation was made, "ought to be something more than a mere itemizing of the titles of printed documents. It ought by its size, organization and detail to give a broad and illuminating insight into the field which it covers." This collection does give this insight into an amazingly active and articulate field and, even though it does not list the literature beyond the end of 1933, it has a distinctly practical value. There are 217 pages, containing more than 2,000 references classified under thirteen main headings, each broken into two to ten classifications.

Real Property Inventory

Real Property Inventory of the Cleveland Metropolitan District.—By Howard Whipple Green, Director, 1900 Euclid Ave., Cleveland, Ohio. Report No. 4. Raymond T. Cragin, Chairman, Real Property Inventory. XI + 291 pp., with large folding map in pocket. Many charts, tables, maps. April 25, 1935. $15.00. Apply to the Director.

Data have been collected on each type of property, the creation of lots, new construction, mortgage finance, and population movements, and analyzed by census tracts—those small geographically constant areas within the district. City-wide trends, and trends within the separate subdivisions, may now be observed. The 12,642 families living temporarily with other families in October, 1932, had decreased to 9,249 in October, 1934. Two new features appear in the Inventory: analyzing the use of industrial space; and the use of street frontage by commercial and retail houses. The curbing influence of the HOLC on mounting foreclosure figures for dwellings is shown: dropping from 3,119 in 1932 to 1,646 in 1934. This is a comprehensive, clear delineation of developments in the numerous fields covered—invaluable to those seeking *all* the facts.

Accounting

Manual of Accounting for Architects.—By The American Institute of Architects. 1935. Standard Document No. 978. XVII + 132 pp., besides many schedules and forms. Apply to the Institute, The Octagon, 1741 New York Ave., Washington, D. C.

With the purpose of helping to secure and maintain a sound financial basis for the architectural profession, on which it may function effectively and profitably, this manual has been prepared by practicing architects largely from the writings of others, to whom full credit is given. The theory of accounting is stated, and the general procedure is explained, adapting it to a practical system that will enable the architect to record intelligently his financial transactions and those of his clients with the constructors of their buildings; thus having constantly available the essential cost data and information.

Noise

Noise: A Comprehensive Survey from Every Point of View—By N. W. McLachlan, D. Sc. (Engineering), London, M.I.E.E. With a foreword by Sir Henry Fowler, K.B.E., Chairman of the Committee on Noise appointed by the Minister of Transport. Oxford University Press, London. 1935. VI + 148 pp. $2.00.

This book is intended to reach both lay and technical readers. Its contents include chapters on: "General Considerations—Behaviour of the Ear; Measurement of Noise; Frequency Analysis; Noise in Buildings; Traffic Noise; Train Noise; Noise Due to Aeroplanes and Motor Vehicles; Vibration Due to Machinery; Noise Due to Electrical Machines; Physiological and Psychological Effects of Noise. Causes, measurements and present remedies are set forth.

Land Economics

The first number of the *Land Policy Circular* appeared in June, 1935, issued by the Division of Land Planning and Development, Resettlement Administration, in cooperation with the Division of Land Economics of the Bureau of Agricultural Economics. It is planned that the *Circular* shall, in large measure, continue to serve the same purpose as the *Land Policy Review*. It will provide technical information in the field of land economics to assist the staff of the Resettlement Administration and its cooperating agencies and groups to keep in touch with developments bearing upon their work. It is a clearing house concerning local, state, and Federal land planning activities and research. 37 mimeographed pp. in the June number. (Apply to Resettlement Administration, Washington, D. C.).

Housing and Town Planning

The report of the XIV International Housing and Town Planning Congress, held in London July 16-20, 1935, is presented in three languages—German, French and English, and under three main divisions: Planned Rural Development and the Preservation of the Countryside; Positive Planning; and Rehousing the People. The articles, and the general reports on them, form an important body of authentic and up-to-date material prepared by distinguished authorities in Austria, Belgium, Czechoslovakia, Denmark, France, Germany, Great Britain, Holland, Hungary, Italy, Latvia, New Zealand, Norway, Poland, Spain, Sweden, and the United States. Paper-bound; 416 pp.; illustrated. (Apply to H. Chapman, Organizing Secretary, International Federation for Housing and Town Planning, 25 Bedford Row, W. C. 1, London, England.)

The New York State Planning Board presents (1935) "A Graphic Compendium of Planning Studies" as basic material for intelligent state planning. 147 photo offset pp. Many maps, charts, tables. The main divisions are: Graphic Geography; Mineral Resources; Land Utilization; Forestry; Water; Power; Recreation; Agriculture; Highways and Transportation; Population; Local Finance; Financing Permanent Improvements. The Chairman of the Board is A. R. Mann; Abraham S. Weber, Secretary. Robert Whitten is the General Consultant of the Board. (Apply to the Board, Albany, N. Y.)

Housing

The Proceedings of the Conference on Low Cost Housing, held May 3-4, 1935, in Atlanta, Ga., under the auspices of the Department of Architecture, Georgia School of Technology, The University System of Georgia, is a pamphlet of 126 pp. It forms the July, 1935, Bulletin of the Georgia School of Technology, Atlanta, Ga., and contains much important and interesting material. (Apply to the School.)

The new profession of housing management is presented in a handy pamphlet of 32 pages entitled "Housing Management—Its History and Relation to Present-Day Housing Problems," by Beatrice Greenfield Rosahn, published by the National Municipal League. The thrilling history of house property management as developed in England by Octavia Hill, beginning in 1870, and carried on by Claude Leigh, Managing Director of the Metropolitan Housing Corporation, Ltd., of London, is followed by an extremely interesting account of the progress made in America in methods of "teaching the tenant." Current management practices of existing housing projects are described, including recreational and social activities, and the technical duties of managers in relation to maintenance costs and rentals. Information on plans for special training in housing management is given. 25c. (Apply to the League, 309 E. 34th St., New York.)

Highways

The Proceedings of the Fourteenth Annual Meeting of the Highway Research Board, held at Washington, D. C., December 6-7, 1934, have been edited by Roy W. Crum and published as Part I by the Division of Engineering and Industrial Research of the National Research Council, in a paper-covered volume of 481 pages. The subjects of the general divisions of the material presented are: Highway Transportation Economics; Design; Materials and Construction; Traffic. (Apply to the Board, 2101 Constitution Ave., Washington.

Propaganda—A Correction

The price of the May, 1935, issue of *The Annals* of The American Academy of Political and Social Science, containing a discussion of "Pressure Groups and Propaganda," is $2.00, instead of the price stated on page 95 of the August issue of THE AMERICAN CITY. (Apply to the Academy, 3457 Walnut St., Philadelphia, Pa.)

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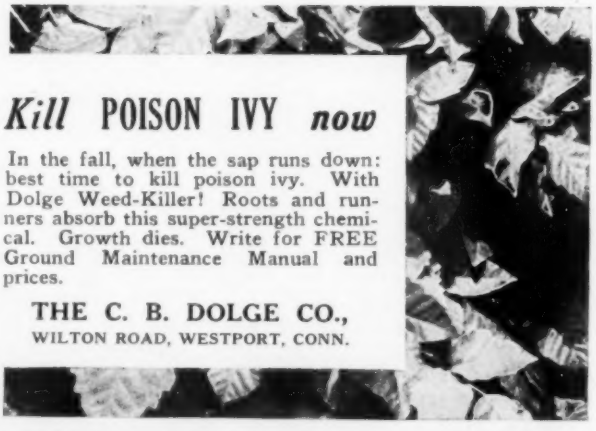

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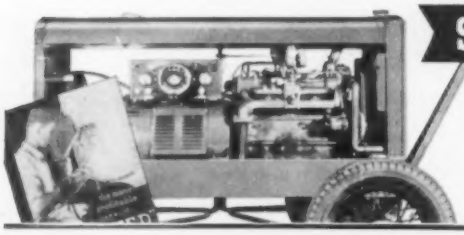

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CONVENTIONS—WHEN AND WHERE

(Figures in parentheses following the name of the convention city indicate the estimated attendance other than local)

SEPTEMBER 9-12.—SWAMPSCOTT, MASS.
Association of American Cemtery Superintendents. Annual convention. Secretary, William B. Jones, Highwood Cemetery, Pittsburgh, Pa.

SEPTEMBER 11-13.—ANN ARBOR, MICH. (350)
Michigan Municipal League. Annual meeting. Director, Harold D. Smith, University of Michigan, Ann Arbor, Mich.

SEPTEMBER 12-14.—LAKE PLACID, N. Y.
American Forestry Association. Annual meeting. Executive Secretary, Ovid Butler, 1727 K Street, N. W., Washington, D. C.

SEPTEMBER 15-18.—PORTLAND, ORE.
American Institute of Park Executives and the American Park Society. Annual convention. Executive Secretary, William H. Walker, 2234 Inglewood Place, South Bend, Ind.

SEPTEMBER 16-18.—DENVER, COLO.
American Water Works Association—Rocky Mountain Section. Annual meeting. (Brown Place Hotel.) Secretary-Treasurer, B. V. Howe, 437 State Office Building, Denver, Colo.

SEPTEMBER 17-20.—PROVIDENCE, R. I. (550)
New England Water Works Association. Annual convention. (Providence-Biltmore Hotel.) Secretary, Frank J. Gifford, 715 Tremont Temple, Boston, Mass.

SEPTEMBER 18-19.—HARLAN, KY. (200)
The Kentucky Municipal League. Annual convention. Executive Secretary, Carl B. Wachs, Municipal Building, Lexington, Ky.

SEPTEMBER 18-19.—KENOSHA, WIS. (600)
League of Wisconsin Municipalities. Annual convention. Secretary, Frederick MacMillin, 114 North Carroll Street, Madison, Wis.

SEPTEMBER 19-21.—QUINCY, ILL.
Illinois Municipal League. Annual convention. Secretary, A. D. McLarty, 500 East Capitol Avenue, Springfield, Ill.

SEPTEMBER 20-26.—GRAND FORKS, N. DAK.
League of North Dakota Municipalities. Annual convention. Executive Secretary, Myron H. Atkinson, Bismarck, N. Dak.

SEPTEMBER 23, WEEK OF.—ATLANTIC CITY, N. J.
American Transit Association and Affiliated Organizations. Annual convention. General Secretary, Guy C. Hecker, 292 Madison Avenue, N. Y.

SEPTEMBER 23-26.—SAN FRANCISCO, CALIF. (1,000)
League of California Municipalities. Annual convention. Secretary, Richard Graves, 223 City Hall, San Francisco, Calif.

SEPTEMBER 23-24.—PALO ALTO, CALIF.
California Sewage Works Association. Annual convention. Secretary, Fred D. Bowlus, 202 Law Building, Los Angeles, Calif.

SEPTEMBER 24-27.—KNOXVILLE, TENN. (700)
International Association of Fire Chiefs. Annual convention. Secretary, James J. Mulcahey, Yonkers, N. Y.

SEPTEMBER 25-25.—FREDERICKSBURG, VA.
League of Virginia Municipalities. Annual convention. Executive Secretary, Morton L. Walierstein, 408 Travelers Building, Richmond, Va.

SEPTEMBER 26-28.—MILWAUKEE, WIS.
Civil Service Assembly of the United States and Canada. Annual assembly. Director, G. Lyle Belsley, 850 East 58th Street, Chicago, Ill.

SEPTEMBER 30-OCTOBER 4.—CHICAGO, ILL.
National Recreation Association. Annual congress. (Sherman Hotel.) Secretary, Congress Committee, Thomas E. Rivers, 315 Fourth Avenue, New York.

OCTOBER 2-4.—EVANSVILLE, IND.
Municipal League of Indiana. Annual convention. Executive Secretary, S. E. Spurgeon, Kokomo, Ind.

OCTOBER 2-3.—CLEVELAND, OHIO.
Ohio Conference on Sewage Treatment. Annual convention. (Statler Hotel.) Secretary, W. B. Lockhart, Sewage Treatment Plant, Fostoria, Ohio.

OCTOBER 4-5.—SCHENECTADY, N. Y.
Joint meeting. New England Sewage Works Association. Secretary, F. W. Gilcreas, State Department of Health, Albany, N. Y. *New York State Sewage Works Association.* Secretary, A. S. Bedell, State Department of Health, Albany, N. Y.

OCTOBER 4-5.—GRAND FORKS, N. DAK.
North Dakota Water and Sewage Works Conference. Annual convention. Secretary-Treasurer, M. D. Hollis, Bureau of Sanitary Engineering, Bismarck, N. Dak.

OCTOBER 5-7.—MILWAUKEE, WIS.
Conference of State Sanitary Engineers. Annual meeting. Secretary-Treasurer, R. E. Tarbett, U. S. Public Health Service, Washington, D. C.

OCTOBER 7-10.—MILWAUKEE, WIS.
American Public Health Association. Annual meeting. Executive Secretary, Dr. Reginald M. Atwater, 50 West 50th Street, New York.

OCTOBER 7-8.—GREENSBORO, N. C.
North Carolina League of Municipalities. Annual convention. Secretary, Patrick Healy, Jr., Capital Club Building, Raleigh, N. C.

OCTOBER 9-10.—PRATT, KANS.
Kansas Association of Municipal Utilities. Annual convention. Secretary-Treasurer, L. C. Angevine, Superintendent Water and Electric Department, McPherson, Kans.

OCTOBER 9-11.—COLUMBUS, NEBR.
League of Nebraska Municipalities. Annual meeting. Secretary-Treasurer, C. E. Beals, 204 Brownell Building, Lincoln, Nebr.

OCTOBER 9-10.—LA CROSSE, WIS.
Wisconsin Chiefs of Police Association. Annual meeting. Secretary, R. H. McCarty, Kaukauna, Wis.

OCTOBER 14-16.—CINCINNATI, OHIO.
Joint conference. American Society of Municipal Engineers. International Association of Public Works Officials. (Netherlands Plaza Hotel.) Executive Director, Donald M. Stone, 850 East 58th Street, Chicago, Ill.

OCTOBER 14-17.—HOUSTON, TEXAS.
American Water Works Association—Southwest Section. Annual convention. Secretary-Treasurer, Lewis A. Quigley, Fort Worth, Texas.

OCTOBER 14-16.—RICHMOND, VA.
International Association of Municipal Electricians. Annual convention. Secretary, W. H. Harth, Columbia, S. C.

OCTOBER 14-18.—LOUISVILLE, KY.
National Safety Council. Annual Safety Congress and Exposition. Managing Director, W. H. Cameron, 20 North Wacker Drive, Chicago, Ill.

OCTOBER 14-18.—OKLAHOMA CITY, OKLA.
National Tax Association. Annual conference. Secretary, W. G. Query, Chairman, South Carolina Tax Commission, Columbia, S. C.

OCTOBER 15-16.—LOUISVILLE, KY.
Institute of Traffic Engineers. Annual meeting. Secretary-Treasurer, Hawley S. Simpson, 175 Fifth Avenue, New York.

OCTOBER 15-18.—SAN ANTONIO, TEXAS.
National Association of Public School Business Officials. Annual convention. Secretary, H. W. Cramblet, Board of Education, Pittsburgh, Pa.

OCTOBER 16-19.—CHICAGO, ILL.
American County Association. Convention. Executive Director, Alex. B. LaZoris, Hotel La Salle, Chicago, Ill.

OCTOBER 16-19.—WHITE SULPHUR SPRINGS, W. VA.
American Institute of Steel Construction, Inc. Annual convention. Executive Director, Charles F. Abbott, 200 Madison Avenue, New York.

OCTOBER 16-18.—BIRMINGHAM, ALA.
American Society of Civil Engineers. Annual convention. Secretary, George T. Seabury, 33 West 39th Street, New York.

OCTOBER 16-18.—ATLANTIC CITY, N. J.
Pennsylvania Water Works Association. Annual meeting. (Haddon Hall.) Secretary, Dr. F. Herbert Snow, 327 Telegraph Building, Harrisburg, Pa.

OCTOBER 17-18.—ROCHESTER, N. Y.
American Water Works Association—New York Section. Fall meeting. (Powers Hotel.) Secretary, R. K. Blanchard, Care Neptune Meter Co., 50 East 42d Street, New York.

OCTOBER 18-19.—ST. PAUL, MINN.
American Water Works Association—Minnesota Section. Annual meeting. Secretary-Treasurer, Ronald M. Finch, Wallace & Tiernan Co., Inc., 414 Flour Exchange, Minneapolis, Minn.

OCTOBER 20-23.—WASHINGTON, D. C.
National Association of Commercial Organization Secretaries. Annual convention. Secretary-Treasurer, R. H. Goddard, Worcester, Mass.

OCTOBER 21-23.—KNOXVILLE, TENN.
American Municipal Association. Annual meeting. Executive Secretary, Paul V. Betters, 850 East 58th Street, Chicago, Ill.

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International City Managers' Association. Annual convention. Executive Director, Clarence E. Ridley, 850 East 58th Street, Chicago, Ill.

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Municipal Finance Officers' Association of the United States and Canada. Annual convention. Executive Director, Carl H. Chatters, 850 East 58th Street, Chicago, Ill.

OCTOBER 21-23.—KNOXVILLE, TENN.
National Association of Tax Assessing Officers. Annual convention. Secretary-Treasurer, Miss Matylda A. Zurowska, City Assessor, Scranton, Pa.

OCTOBER 23-26.—SAN DIEGO, CALIF.
American Water Works Association—California Section. Annual convention. Secretary-Treasurer, J. E. Phillips, 207 South Broadway, Los Angeles, Calif.

OCTOBER 25-26.—URBANA-CHAMPAIGN, ILL.
Central States Sewage Works Association. Annual meeting. Secretary-Treasurer, G. H. Radebaugh, Urbana-Champaign, Ill.

NOVEMBER 4-6.—DURHAM, N. C.
Joint convention. American Water Works Association—North Carolina Section. North Carolina Sewage Works Association. Secretary, M. F. Trice, State Board of Health, Raleigh, N. C.

NOVEMBER 4-6.—SHEBOYGAN, WIS.
American Water Works Association—Wisconsin Section. Annual convention. Secretary, L. A. Smith, Superintendent of Water Works, City Hall, Madison, Wis.

NOVEMBER 6-8.—DES MOINES, IOWA.
American Water Works Association—Missouri Valley Section. Annual meeting. Secretary, Earl L. Waterman, University of Iowa, Iowa City, Iowa.

NOVEMBER 7-8.—ROANOKE, VA.
American Water Works Association—Virginia Section. Annual conference. (Hotel Roanoke.) Secretary, H. W. Snidow, Department of Health, 601 State Office Building, Richmond, Va.

NOVEMBER 11.—BOSTON, MASS.
National Pedestrians' Association. Annual convention. Executive Secretary, M. S. Smith, 1468 Broad Street, Providence, R. I.

NOVEMBER 12.—BOSTON, MASS.
International Institute of Transport. Annual convention. President, Charles Davis, 1468 Broad Street, Providence, R. I.

NOVEMBER 13.—BOSTON, MASS.
National Highway Traffic Association. Annual convention. Executive Director, Arthur H. Blanchard, 1468 Broad Street, Providence, R. I.

NOVEMBER 15-16.—ASBURY PARK, N. J.
New Jersey Health and Sanitary Association. Annual meeting. (Berkeley-Carteret Hotel.) Secretary, Dr. Edward Guion, Box 418, Atlantic City, N. J.

NOVEMBER 25-26.—PROVIDENCE, R. I.
National Municipal League. Annual conference on government. Secretary, Howard P. Jones, 309 East 34th Street, New York.

DECEMBER 9-12.—MIAMI, FLA.
American Association of State Highway Officials. Annual convention. Executive Secretary, W. C. Markham, 1222 National Press Building, Washington, D. C.

JANUARY 20-24, 1936.—CLEVELAND, OHIO.
American Road Builders' Association. Annual Road Show. Engineer-Director, Chas. M. Upham, National Press Building, Washington, D. C.

JUNE 8-12, 1936.—LOS ANGELES, CALIF.
American Water Works Association. Annual convention. (Hotel Biltmore.) Secretary, Beekman C. Little, 29 West 39th Street, New York.

● Scarcely a week passes but you will find brick pavement being laid on Chicago's Loop streets.

It is replacing other pavement types.

As Chicago well knows, brick can "take" it. Many of its principal cross-city thoroughfares are brick that were laid years and years ago. Yet, with Chicago's heavy traffic and ever-changing weather the brick pavements serve on and on.

And so Chicago, modern as tomorrow, is laying brick on its streets in its principal business district.

* * *

Of the three leading pavements, brick has the lowest *—by far the lowest —* maintenance costs. The reason: brick withstands weather damage as well as traffic wear. A brick surface has far greater immunity to weather damage than any other commonly used paving material. It is denser —less absorbent. It is not opened by expansion and contraction; it does not soften under intense heat. Age does not change or weaken its structure. And as for traffic wear, nothing on wheels can damage it.

Plan now to make your pavements economical. Build of brick on both new construction and resurfacing jobs.

For further information write, National Paving Brick Association (Affiliated with Structural Clay Products, Inc.) 1245 National Press Building, Washington, D. C.

BRICK

FOR NEW CONSTRUCTION OR RESURFACE JOBS

Why not remember to mention THE AMERICAN CITY?

NEWS AND ILLUSTRATIONS

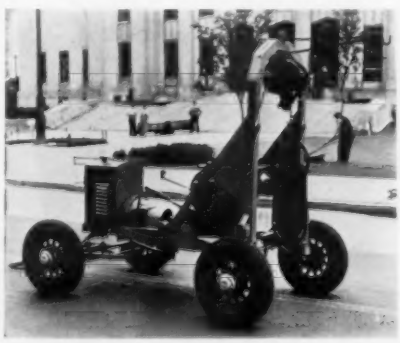
Items of Interest to City, Town and County Officials, and Others Concerned with the Economical Construction and Efficient Operation of Public Improvement Undertakings

A Power Sewer Cleaner

A new piece of motorized equipment embodying all the features of the hand-powered O. K. Champion sewer-cleaning machine made by the Champion Corporation, 4716 Sheffield Avenue, Hammond, Ind., has been announced by that company. The equipment includes a patented expansion bucket which bites into the blockade and fills itself, and on the reverse pull its jaws snap shut, securely holding the load. The filled bucket is hauled to the street level and hoisted up to the boom hook, where its jaws are automatically opened, releasing the load on the street.

An ingenious linkage between the knee-action wheels and the clutch lever serves as an automatic safety clutch and becomes active instantly upon overload. This clutch can be set at any predetermined tension. There is an automatic level wind on the cable drum, so that the ½-inch 9-strand cable is always reeled up and unreeled in parallel coils, doing away with jamming.

A secondary free-wheeling clutch on the cable drum acts when unreeling cable into the sewer while the bucket is taking its load and being drawn forward by the machine at the other manhole. This free-wheeling clutch disconnects the 20.5 to 1 reduction gear train that connects the cable drum to the motor, so that it revolves freely on its own axle, saving power and eliminating the wear and tear. The clutch is engaged by hand and released with a slight wrist movement that automatically locks it in open free-wheeling position. A 7-horsepower, 2-cylinder, 4-cycle radiator-cooled LeRoi engine with speed regulator furnishes the power for this sewer-cleaning unit. The entire O. K. Champion equipment rides on 6.00 x 16 Firestone pneumatic tires. A secondary cable drum carrying 450 to 800 feet of 3/16-inch galvanized cable may be left in the sewer over night and used to pull through the heavy cable in the morning, saving time and the necessity of using sewer rods when a job is left unfinished over night. An automatic device on the upper cable guide sheave wheel just below the arch instantly clamps the cable in place when the load is relieved, preventing back-lash on the big drum. When the load is applied, it swings out of the way and does not impede the cable.



THE NEW O.K. CHAMPION POWER SEWER-CLEANING UNIT

DISPLAYED IN THIS PICTURE IS A PART OF THE CLOSE-TO-ONE-THOUSAND CLETRACS BEING SHIPPED TO DEPARTMENTS OF THE UNITED STATES GOVERNMENT BY THE CLEVELAND TRACTOR CO.

The tractors range in size from 20-hp to and including 55-hp and are equipped with bulldozers and air compressors. These units were shipped to the following Federal departments: Forest Service, Indian Service, Ordnance Department, Army Air Corps, National Parks, U. S. Engineers, Bureau of Public Roads, Migratory Game Reserves, U. S. Coast Guard, Department of Justice, Soil Erosion Service, Veterans Administration, Bureau of Reclamation, Panama Canal, Virgin Islands, Hawaii, War Department and U. S. Navy

Local Paper Publishes Appreciation of Water Superintendent

The *Stevens Point Daily Journal*, Stevens Point, Wis., recently published an extensive article on the municipally operated water utility. A few days later, its editorial page repeated a portion of the earlier article and then continued: "But no story about Stevens Point's water would be complete if it didn't include reference to the man who above all others was responsible for bringing it to us. Charles E. Van Hecke, the Department Superintendent, is the acknowledged 'father of Stevens Point's water supply.' We remember him as a member of the Common Council many years ago when he began to tell of the possibilities of the Plover River basin. We remember the meagre appropriations that were made to make it possible for him to sink little experimental wells at Plover Hills. He talked so much about this new source of supply that we have an idea it was partly to keep him quiet and let him enjoy himself that the Council did even what it did to cooperate with him. But Charles Van Hecke wasn't chasing a will 'o the wisp. He knew what he would find, and finally he proved it. It was a long and patient job, and support came slowly at first. The first movement he led to get the city to take over the old utility and develop the new source of supply was a miserable failure. But Charles Van Hecke lived to see his faith vindicated, although it would have cost the city much less had it acted when he first proposed purchase."

Mr. Van Hecke uses American Cast Iron Pipe Co. mono-cast pipe in all the sizes in which it is produced, and uses McWane cast iron pipe on his service lines.

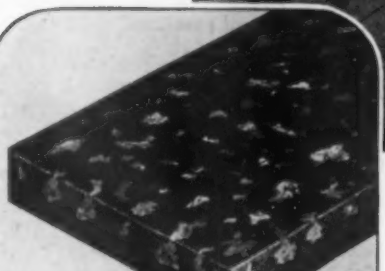
Associated Municipal Signal Services Hold Convention

The Associated Municipal Signal Services' Convention was held in Poughkeepsie, N. Y., June 20-22, 1934. The New England Municipal Signal Association, New Jersey Municipal Signal Association and New York State Municipal Signal Association, group members of the A.M.S.S., were represented. Many municipal signal superintendents from other sections were present, and it is believed that the success of this convention will lead to their attempt to form groups in their states or districts.

One of the high lights of the Convention was the presentation to Edwin Cochran, Secretary-Treasurer of the A.M.S.S., of a gift contributed as a token of his effort in building the Association from a group of six fire-alarm superintendents in 1921 to over 250 members today.

when rainy days bring SKIDS...

J-M Mineral Surfaced Plank keeps Bridge Decks safe as Concrete



Johns-Manville

MINERAL SURFACED ASPHALT BRIDGE PLANK

WE take coarse trap rock . . . force it in under hydraulic pressure . . . permanently interlock it with the fibrous asphaltic body of the plank . . . and give you a traction when wet that's equal to that of concrete.

So much for safety. Now see how effectively J-M Mineral Surfaced Plank solves every other important bridge-surfacing problem . . .

Weight? In the one-inch thickness, it weighs only 9 lb. per sq. ft. **Heavy traffic flow?** It is strong, durable, practically wear-proof. Will not warp, crack, splinter or decay. Resilient, it is unharmed by vibration or deflection. **Severe weather conditions?** Special asphalt and fibre content prevents brittleness in cold weather; it will not disintegrate under frost action. **Unskilled labor?** Local crews install it easily, quickly and with entire satisfaction. **Maintenance of traffic flow?** It is ready for duty the moment it is laid. Frequently, traffic is continued during application.

• • •

For a set of engineering data sheets describing in detail both the Smooth and Mineral-Surfaced types of J-M Asphalt Bridge Plank, mail the coupon. Johns-Manville, 22 East 40th Street, N. Y. C.

JOHNS-MANVILLE
22 East 40th Street, New York

Send me a set of Engineering Data Sheets on J-M Asphalt Bridge Plank.

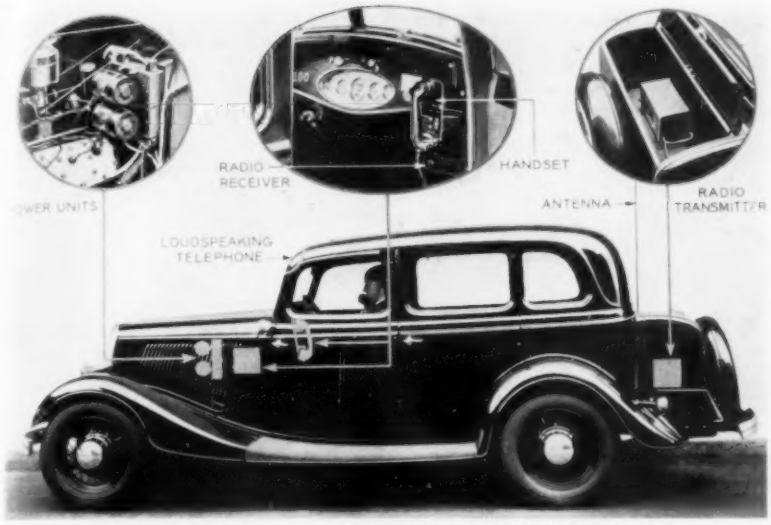
Name_____ Title_____

Organization_____

Address_____

City_____ State_____

AC-9A-35



THE BELL TELEPHONE LABORATORIES TWO-WAY RADIO SYSTEM

What Two-Way Radio Equipment Looks Like

The accompanying photograph shows a police-department sedan equipped to talk with headquarters. This is the ultra high-frequency two-way system designed by Bell Telephone Laboratories and sold by Western Electric Co. to Evansville, Ind., and Nashville, Tenn. The transmitter is 5-watt, uses four 5-element tubes, weighs 20 pounds, and is held to its frequency by a crystal. The receiver is a 7-tube superheterodyne. To talk from the car, the officer lifts the telephone from the instrument board, simultaneously flipping a switch, and the first sound of his voice automatically puts the car's transmitter on the air; the instant he stops talking, it switches off.

Salt for Stabilized Roads

It has long been known that damp clay has a binding quality practically equal to that of most road materials of high cost. It has also been found that certain other materials when mixed with the clay give a greater supporting value to the mixture. Sand and clay provide a natural stabilizer for roads with high supporting value in addition to high cohesion. Clay is subject to fairly wide limits of expansion and contraction when alternately dampened and dried. In a roadway, untreated clay shrinks as it dries. This permits embedded coarse aggregate to become loose and make a floating surface. The dry clay then turns to dust and is blown away by the wind or cast aside by traffic.

Recent research has indicated that salt improves the stabilizing effect of clay. Research at Cornell University by Dr. H. Ries along these lines has included tests on plasticity, volume shrinkage, field moisture, permeability, and capillary movement of moisture in various salt-clay mixtures and salt-soil stabilized mixtures, with the following conclusions:

1. Salt does not appreciably change the cohesion of clay, as shown by the fact that it does not materially alter its plasticity.

2. Upon drying, salt-treated clay and soil-stabilized mixtures shrink much less than those not treated with salt.

3. The moisture-retaining quality of clay is decidedly increased by treating it with salt.

4. As water evaporates from the surface of the salt-soil mixtures, minute crystals of salt form a dense, hard crust which closes the pores and retards further evaporation.

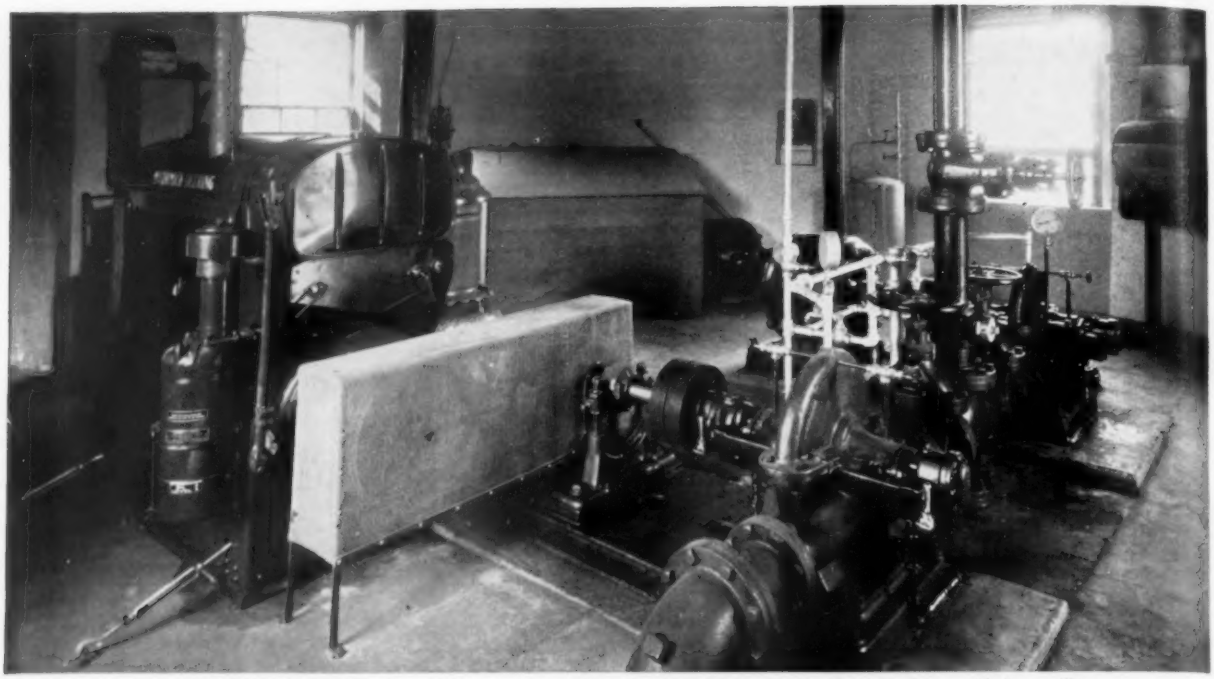
5. Salt added to clay produces some coagulation of clay particles, which means that in a stabilized road the rate of capillary action of soil moisture is slightly increased, and moisture films are more evenly distributed throughout the mass. The resultant effect is that salt aids in the compaction of the soil.

6. When water falls upon the surface of a salt-treated, stabilized road, the surface salt is dissolved. Brine thus formed sinks below the surface. The clay in the surface swells somewhat, and being freed of most of its salt, some of it disperses or breaks up into a very fine colloidal condition, an effect peculiar to salt alone. This expanded clay and finely divided or colloidal material stop up the pores and tend to prevent further percolation of water downward from the surface, thus forcing excess water to drain from the road.

Coagulation of clay and re-crystallization of salt again take place in a salt-surface-treated road as drying occurs and the salt brine creeps to the surface.

A booklet describing the theories of the soil-stabilized roads and discussing actual road construction using salt-stabilized soil may be secured from the Research Laboratory, International Salt Co., Inc., Ithaca, N. Y.

SPREADING ROCK SALT ON A STABILIZED SOIL ROAD PROJECT

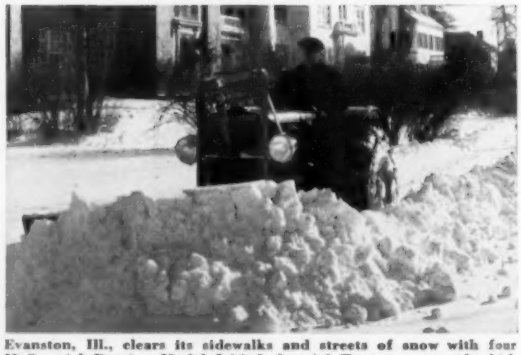


McCormick-Deering Model P-30 Power Unit operating a 300-gallon pump in the municipal water plant at Markesan, Wis.

Low-Cost Power for Every Job

FOR the practical solution of your power problems, come to McCormick-Deering. This line of wheel and crawler tractors and stationary power units has thousands of owners and millions of hours of work to recommend it for your use. You can depend on McCormick-Deering to cut your power costs to the bone no matter what job is assigned to it. Lay your power requirements before the nearest International Harvester branch or McCormick-Deering distributor—let them specify the right size of tractor or power unit for the job. Also have them tell you about the remarkable economy of the McCormick-Deering Diesel engine which is available in the TD-40 TracTracTor and as a power unit.

INTERNATIONAL HARVESTER COMPANY
OF AMERICA
606 So. Michigan Ave. *(Incorporated)* Chicago, Illinois



Evanston, Ill., clears its sidewalks and streets of snow with four McCormick-Deering Model I-12 Industrial Tractors, two of which are equipped with straight-blade plows and two with V-type plows.

The Bureau of Markets, Detroit, keeps its covered market area clear of trash with this McCormick-Deering I-12 Tractor and sweeper.

An economical, fast-working outfit for many jobs—a McCormick-Deering Model 20 Industrial Tractor with power shovel.

McCORMICK-DEERING

THE UNIVERSAL FLASH WARNING SIGNAL

New Type of Warning Signal

A new safety signal which is non-mechanical and is reported as requiring no maintenance other than the charging of the battery, has been developed by the Universal Safety Apparatus Co., 222 West Adams Street, Chicago, Ill. This signal employs the flashing light principle similar to the "on and off" signal used at railroad crossings. It is an acknowledged fact that flashing lights are more effective than steady lights in arresting attention to warn of approaching danger.

The manufacturer states that all vital parts of this device are hermetically sealed and impregnated with a material which prevents climatic conditions from interfering in any way with its performance. The model illustrated is No. 600, which has three extra outlets for additional standards. As many as three additional standards can be connected to No. 600, making a total of four standards operating in series on one battery. This arrangement is suggested where a street is to be blocked off on account of repair and construction work.

Tests were conducted by the city of Chicago over a period of 30 days; the Department of Streets and Electricity found the apparatus very satisfactory from the standpoint of electrical operation.

Aluminum Paint for Pacific Coast Bridge

After consideration of black, grey and aluminum paint for the final coat on the new San Francisco-Oakland Bay bridge, the decision has been reached to use aluminum because of its satisfactory appearance and durability. The facts that aluminum paint is already standard equipment for highway bridges in 27 states and that most of the bridges in the New York area are covered with this metallic paint which is standing up well under heavy-duty service even around salt water, greatly influenced the decision.

Some groups favored dark paints on the score of visibility, but it was pointed out that whereas dark colors absorb light, bright paints, such as aluminum, reflect the rays, making an aluminum-painted surface actually more visible even through fog.

The complete paint system for the San Francisco-Oakland Bay bridge involves the use of several paints. Over the bare steelwork are first applied two coats of rust-inhibitive red lead, followed by an intermediate base coat of black paint. The aluminum field coat concludes the job. This system, in the opinion of paint experts and engineers, will furnish a fool-proof coating that offers maximum endurance with a minimum of maintenance worries, at the same time presenting an attractive appearance.

The front cover of the August issue of THE AMERICAN CITY depicted the present status of this great structure with the piers complete, and catwalks in place.

A Weighing and Recording Rain and Snow Gage

A new model of the Fergusson weighing and recording rain and snow gage is announced by Julien P. Fries & Sons, Inc., Baltimore, Md., which records rain, snow, hail and sleet with equal facility and in the same manner. Precipitation is delivered through a collector ring of known area to a receiver resting upon a spring balance. This weighing mechanism is extremely sensitive, for one-hundredth of an inch of rainfall is sufficient to depress the balance and register on the record chart.

The record cylinder is revolved daily, or weekly, by a jeweled clock movement, so that rainfall is shown as ordinates; time as abscissae. The unique linkage from the weighing mechanism to the pen arm allows an extremely open scale on a relatively narrow chart by reversing pen movement at several even increments of the gage capacity. Capacities up to 12 inches of rainfall are offered with provisions for catchment of overflow 10 inches in excess of this amount.

Pocket-Size Kit for First Aid Treatment

A compact, pocket-size kit containing all the equipment necessary for the first aid treatment of snake bites has been developed by E. D. Bullard Co., 275 Eighth Street, San Francisco, Calif. This packet, called the Venex Kit, has been used by men working or vacationing in territories frequented by poisonous snakes.

Contrary to the belief of most laymen, bites of rattlesnakes and other poisonous reptiles commonly found in North America are not usually fatal provided proper first aid treatment is promptly administered. According to the medical profession, the venom deposited gradually seeps into the blood stream over several hours, and if steps are taken immediately to remove the venom from the wound, no fatality is apt to result. Suction is recommended as the best method for removal of the venom. It is said that three drops of venom will kill. If only one drop is extracted from the wound during the first hour, a life may be saved.

FIRST AID KIT FOR SNAKE BITES

Turner Named President of Eagle Signal

Harrison I. Turner has been elected President of the Eagle Signal Corporation of Moline, Ill., succeeding V. C. Stanley of Boston, who requested that he be relieved of the position.

H. I. TURNER, PRESIDENT, EAGLE SIGANL CORPORATION

W. F. Benson has been appointed Sales Manager in charge of the company's municipal business.

The Eagle Signal Corporation is enjoying a good business and its engineers are making marked developments both in traffic signal efficiency and timing devices for controlling the action of electric motors.

A. M. Byers Co. to Make Steel Pipe

The A. M. Byers Co., Pittsburgh, Pa., active in the wrought iron industry since 1864, has just announced its third major expansion project in recent years. Several years ago Byers completed a large modern wrought iron mill at Ambridge, Pa., for manufacturing genuine wrought iron under its new process. Following this, the operations were further expanded to include the reintroduction of a wide range of wrought iron products.

The third step in broadening the sales and manufacturing activities of the company is the manufacture of Byers steel pipe, which will be made in the company's modern pipe mills under the same executive supervision as exists on wrought iron pipe.

17% FEWER CRIMES
60% MORE ARRESTS

...since Evansville put Radio on the Force!

	1934 JAN.-MAY No Radio	1935 JAN.-MAY 2-Way Radio	Decrease	Increase
ROBBERY	31	18*	13	
BURGLARY	128	113	15	
GRAND LARCENY	15	24		9
PETIT LARCENY	340	300	40	
AUTO THEFT	205	147	58	
ARRESTS on the above complaints	134	179		45

*10 of these during January—the month when Radio was installed.

Roy E. McConnell, Chief Engineer, at control desk of Evansville's Western Electric equipped Police Radio station.

In January 1935, Evansville, Indiana, installed Western Electric's new ultra-high frequency 2-way Police Radio. The prompt decrease in number of crimes—and marked increase in arrests—tell their own story.

With this 2-way radio, patrols not only receive alarms. They also acknowledge them—request further instructions—report crimes or suspicious circumstances—keep headquarters constantly informed of their position and progress.

Western Electric 2-way equipment is compact, sturdy, reliable. For new booklet giving full details, write Graybar Electric, Graybar Building, New York—or telephone Graybar's nearest branch.

Western Electric

POLICE RADIO TELEPHONE EQUIPMENT

Distributed by GRAYBAR *Electric Company.* *In Canada: Northern Electric Co., Ltd.*

MONO-CAST PIPE 36 INCHES IN DIAMETER AND IN 16-FOOT LENGTHS IS NOW BEING MANUFACTURED

Acipco Plant Now Makes 36-Inch Mono-Cast Centrifugal Pipe

The American Cast Iron Pipe Co., Birmingham, Ala., has added 36-inch diameter pipe to the range of pipe sizes produced by the Mono-Cast centrifugal method. All the necessary equipment has already been installed in the Acipco plant, and several orders have been booked for the 36-inch size.

The manufacture of Mono-Cast centrifugal pipe on a commercial basis began in 1924; and for several years this pipe was made only in the smaller sizes. To meet the demand for this pipe in the large diameters, a new shop was built, in 1931, for the manufacture of 14-, 16-, 18-, 20-, and 24-inch diameter pipe. With the addition of the new size, Mono-Cast centrifugal pipe is now available in diameters from 3 inches to 36 inches inclusive. This product is made in 16-foot lengths, being bell and spigot type with the bead cast on the spigot end.

Diesel Engines for Modern Power Plants

Diesel engines are dependable, whether the service be 10 hours daily or continuous over long periods without shutdowns. The Superior diesel stationary engines, which are cold-starting, four-cycle machines, operate efficiently on a wide range of fuel, permitting the purchase of low-priced local products, with an exceedingly low consumption of fuel oil.

The National-Superior Co., Superior Engine Division, Springfield, Ohio, in its Bulletin No. 133 shows some of the savings possible with Superior diesel engines. As stated in the Bulletin, the amount of savings possible depends entirely upon the present power equipment. The table below gives an opportunity to make comparisons and determine approximately what can be done:

2½ to 5 mills per bhp per hour for power
4 to 7 mills per kwhr for generating electricity
4 to 8 mills per cu. yd. for large dredges
20 to 30 cents per ton of ice
$1.50 to $2.25 per million gallons (100-foot head) for water pumping service

One of the advantages of the stationary diesel engines, which vary in horsepower output from 160 to 900 for types MS and OS, is that the services of a skilled engineer are not required. Part-time attention by mechanical help already available at the plant is generally sufficient. This is due to the simplicity of design, minimum of working parts, all of which are enclosed in dust-proof and oil-tight housings, and the centralized location of control. No moving parts are exposed to the operator. Fire hazards are eliminated by the ability of this engine to burn low volatile fuels. No torches, hot heads, or other exposed heated surfaces are required. The engine starts in a few seconds by compressed air to all cylinders. No warming-up is required, and the full capacity of the engine is available at once.

The Superior diesel is of the constant pressure mechanical injection type. It is rugged in construction, designed for heavy-duty and continuous service. The horsepower ratings are conservatively based on 75 pounds mep., giving a large emergency over-load capacity.

The lubricating system is force-feed, dry-sump type. A positive pump unit, combining suction and pressure pumps, is mounted at the control end of the engine and is driven by a silent roller chain from the crankshaft. The suction pump takes oil from the sump and forces it through a filter and cooler to the tank. It then flows by gravity to the pressure pump and is delivered under pressure through a header to the main bearings, then through the drilled crankshaft to the crankpin bearings, and through drilled connecting rods to piston pins. Separate oil lines from the header supply the camshaft bearings, governor, and other parts.

A New All-Wheel-Drive Unit

Marmon-Herrington Co., Inc., Indianapolis, Ind., has recently announced the application of its all-wheel-drive principle of design and construction to the Ford V-8 truck, thus introducing an all-wheel-drive vehicle. By installing specially designed driving front axle and propeller shaft, a two-speed auxiliary transmission and other necessary parts, this company has succeeded in developing this all-wheel-drive truck and has retained intact the remainder of the Ford V-8 just as it comes from the factory.

A New Two-Wheel Derrick

R. G. LeTourneau, Inc., Peoria, Ill., is now manufacturing a two-wheel derrick for use with tractors. This new derrick is simply constructed, consisting of only three main parts—the boom, the tongue and the wheels. The boom comes in three lengths, 20, 30 and 40 feet. The derrick is operated by means of a LeTourneau 2-drum power unit mounted at the rear of the tractor. One drum of the power unit supplies the hoist line, and the other, the boom. The line speed of the lift varies from 65 feet to 400 feet per minute, depending upon the rigging.

The capacity of the LeTourneau two-wheel derrick depends on the size of the tractor to which it is attached. The 20-foot boom derrick when operated by a 75 tractor will easily lift 12½ tons and carry 10 tons. With a 50 tractor the same derrick will lift 10 tons and will carry 7½ tons. A 35 tractor and a derrick will lift 7½ tons and carry 5 tons, and a 20 tractor will lift 5 tons and carry 3 tons.

This two-wheel derrick is designed particularly for use on construction jobs and industrial yards, and is a handy unit for loading and unloading heavy equipment, laying pipe and culvert, placing poles and heavy timbers, lifting or moving heavy materials, etc. It can be connected to or disconnected from the tractor by simply dropping the drawbar pin.

THE NEW TWO-WHEEL DERRICK

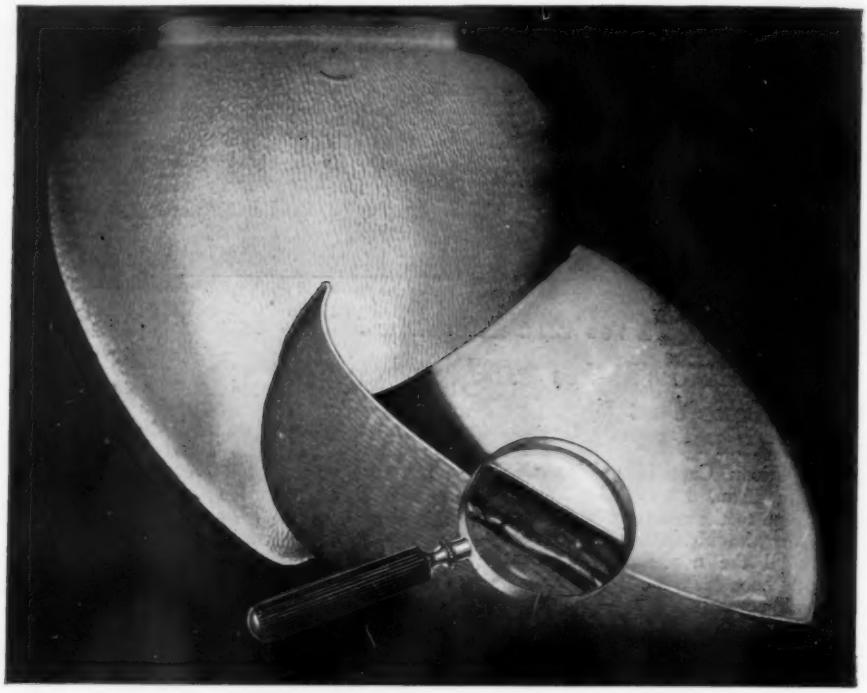
Faber with Chlorine Institute

Harry A. Faber has recently been appointed assistant sanitary engineer of The Chlorine Institute, Inc., New York City, replacing W. M. Bingley, who resigned. Mr. Faber is a graduate of Cornell University, 1930, and was formerly in the employ of the Consolidated Water Co. of Utica, N. Y.

Walter Motor Truck Co. Moves to Larger Quarters

The Walter Motor Truck Co., Inc., formerly located at Long Island City, N. Y., has moved to 1001 Irving Avenue, Ridgewood, Long Island, N. Y., where it is establishing a modern factory, constructed with every convenience for efficient and proper production of Walter Tractor Trucks and Snow Fighters. The premises cover about three times the space of the company's former property.

INSIST ON GOOD STREET-LIGHTING GLASSWARE



LOW-COST STREET LIGHTING DEPENDS TO A GREAT EXTENT ON THE GLASSWARE

IN TWO important ways, glassware affects your street-lighting cost. Strong glassware saves money—lasts longer, resists breakage. Efficient glassware saves light—puts more of the light you pay for on the streets you use. To make sure of these savings, you must *demand* good glassware.

A fine-appearing ornamental globe—Gleason-Tiebout No. 124 alabaster ripple, with canopy

Gleason-Tiebout glassware is strong. The glass is of proper thickness; it is laminated; it is made of carefully selected and tested materials. It is designed by engineers who know street lighting.

Gleason-Tiebout glassware is efficient. Outside, is a thick layer of crystal-clear glass, diffusing the light through its special rippled surface. Inside, is a very thin but very effective layer which completes the diffusion. In this way, you have perfect diffusion with the least possible loss of light.

Gleason-Tiebout glassware is made to meet the exacting specifications of General Electric engineers. These engineers will be glad to assist you in planning installations that will meet every requirement.

BETTER LIGHT BETTER SIGHT

GLEASON-TIEBOUT GLASS COMPANY

99 COMMERCIAL STREET, BROOKLYN, N. Y.

GT 38

THE S. & W. ".357" MAGNUM REVOLVER

A New Powerful Hand Firearm

The S. & W., ".357" Magnum revolver is said to be the most powerful hand arm in the world. The term "Magnum" as applied to rifles means "a greater chamber capacity than military dimensions, and power beyond the normal expectancy of the caliber."

Smith & Wesson, Springfield, Mass., designers of the S. & W. Magnum revolver, kept in mind two things, first, to bring out a more powerful hand arm, and second, to definitely take advantage of all rules covering the "Any Revolver Matches." This revolver carries a bullet of actual diameter of .357. The barrel is 8¾ inches maximum and 3½ inches minimum, with a finely checked rib and heavy recessed extractor rod lug. The cylinder is of heat-treated chrome-nickel steel with a recessed head space and patented burnished chamber walls.

The hammer has the full surface of the thumb piece checked to prevent slipping in rapid fire. The hammer fall is weighed and timed for uniform ignition and least disturbance of the arm. The trigger has the S. & W. grooving with a glass-hard point engaging the hammer notch. The trigger pull, single action, is from 3¾ to 4 pounds and with double action, 10 pounds. The stocks are of especially selected Circassian walnut with monograms and S. & W. checking.

This new hand arm uses .38/44 S. & W. Special, .38 S. & W. Special Hi-Velocity, .38 S. & W. Special, .38 S. & W. Special Super-Police, and .38 S. & W. Special Mid Range ammunition, as well as the new S. & W. .357 Magnum cartridge, which was especially developed for it by the Winchester Co.

New Garbage Collection Units for Cleveland

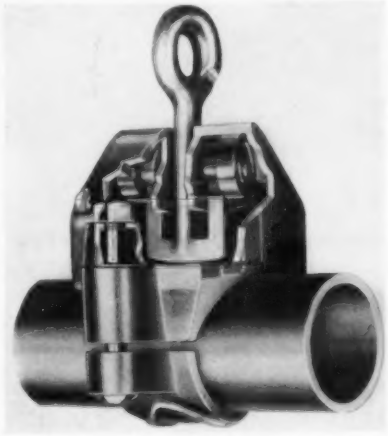
A fleet of 25 new garbage collection units has recently been placed in service by the city of Cleveland, Ohio. The bodies were built by Gar Wood Industries, Inc., Detroit, Mich., and installed on semi-trailer chassis furnished by Truck Engineering Co., Cleveland, Ohio. The tractors are all Chevrolet 1½-ton, 157-inch wheelbase, with a sleeper cab in which shelves are installed, replacing the usual berth. This provides space to carry the pick-up cans and gives room for four men all inside.

The capacity of each collection unit is 9 cubic yards with 3-cubic-yard hinged extension sides, giving 12 cubic yards total capacity. The bodies are 16 feet long and 7 feet wide, and are constructed watertight of 10-gage steel, with double-acting watertight tailgates. Wheelhousings are provided, thus permitting low mountings for the bodies. A rack installed on the front of the body accommodates the tarpaulin when the body is being loaded.

New Ball Bearing for Swing Hangers

A new hanger for playground swings, which has two single race, self-contained ball bearings operating in oil, has been announced by the J. E. Burke Co., of Fond du Lac, Wis.

The oil cavities of the hanger require filling only once a season and are filled by means of an ordinary hand oiler by inserting the spout into rain-proof oil holes drilled in the casing at the oil level line and the case filled to overflowing. The oil is so confined that it does not splash out, according to the manufacturer, nor does it drip upon the occupant or run down the swing chains.



THE NEW PLAYGROUND SWING HANGER FOR BURKE-BUILT EQUIPMENT

The weight of the occupant and the swing are divided equally between the two ball bearings of each hanger. The cap, filler block, pendant and pendant housing are of certified malleable iron, heat-treated and hot-galvanized after machining; the heavy low-carbon machine bolts are also hot-galvanized so that no rustable metal is exposed. Application for patent has been made.

Keefer, of Rensselaer, Dies

George M. Keefer, Sales Manager of the Pittsburgh Branch of the Rensselaer Valve Co., of Troy, N. Y., died recently fter serving his company faithfully for 31 years. He was well known in the Pittsburgh territory, and his value to the water-works industry was exemplified by his election as a trustee of the Central States Section of the American Water Works Association.

Kennedy Appoints Lane

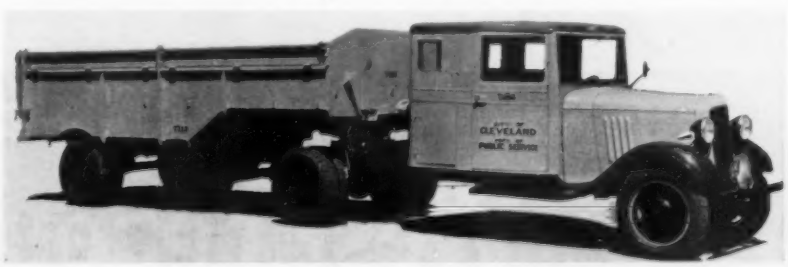
The Kennedy Valve Manufacturing Co., Elmira, N. Y., has announced the appointment of O. R. Lane as its representative in Oklahoma, Arkansas, Tennessee, eastern Missouri and southern Illinois and Indiana, with headquarters at 455 Paul Brown Building, St. Louis, Mo.

Newark, N. J., Awards Pipe-Lining Contract

Newark, N. J., has recently awarded a contract to the T. A. Gillespie Co., of New York, for cleaning and relining with cement mortar a total of 30,000 feet of 48-inch riveted steel pipe which is part of the Pequannock supply system which has been in almost uninterrupted service for 39 years. The contract calls for cleaning the interior of the main and applying a ¼-inch cement mortar lining by machine. The thickness may be increased wherever advisable.

Jones Joins Caterpillar

W. P. Jones, formerly northwestern representative for J. D. Adams Co., Indianapolis, Ind., has joined the sales force of the Caterpillar Tractor Co., Peoria, Ill., specializing in governmental and construction sales. Mr. Jones has represented Adams in the Northwest for the last eight years, and for the eight years preceding that period was a County Engineer in Idaho in charge of construction and maintenance. He is well-known through the West, where he took an active part in tests of construction equipment for government purchases. Because of his familarity with conditions in the West, he has been assigned to that division by Caterpillar, with headquarters at Spokane, Wash.



ONE OF THE NEW GARBAGE COLLECTION TRUCKS ADDED TO THE FLEET USED BY THE CITY OF CLEVELAND, OHIO

POORLY LIGHTED STREETS

like driving behind a muddy windshield

● You have to *see* danger in order to avoid accidents. That's why visibility, impaired by inadequate street lighting, multiplies the night accident hazard many times.

Let's look at facts . . .

In the past twenty years speeds of travel have increased. More cars have made traffic more congested. In the daytime, where visibility is not an important factor, better roads have decreased the accident hazard. However, at night, when visibility is *all important*, visibility conditions have not increased in proportion to increased speeds of travel.

During this period, total municipal expenditures have, on the average, increased 300%. Street lighting expenditures, on the average, have increased only 50%. *And there are 1700% more cars on the streets!*

Economic loss resulting from these conditions means that the community pays for good street lighting whether it gets it or not.

Westinghouse, world's largest maker of lighting equipment, provides a complete line of street lighting equipment unsurpassed in durability and efficiency. Westinghouse also maintains an advisory staff of skilled street lighting engineers who are always at your service. For complete details, write Westinghouse Electric & Mfg. Co., Lighting Division, Edgewater Park, Cleveland, Ohio.

WHEN YOU THINK OF *Lighting* THINK OF

Westinghouse

Outdoor Lighting

A Section of *The American City*
Devoted to the Lighting of Streets, Highways, Bridges, Airports, Athletic Fields and Parks, and the Floodlighting of Public Buildings

Sodium Light 35 Times Moonlight for San Francisco-Oakland Bridge

THE largest and most spectacular installation of sodium lighting in the world will provide more than 8 million lumens of that new and highly efficient golden yellow illumination for the San Francisco-Oakland Bay bridge upon its completion, according to General Electric engineers, designers of the sodium-light equipment. More than 35 full moons would be required to give the same average intensity on the upper roadways of the double-deck spans as will be provided by this amount of sodium light.

A total of 922 G-E Novalux sodium luminaires will be supplied and will be used in 25 circuits strung along about 15 miles of roadways for the double-deck spans, the tunnel, and the approaches.

On the upper deck of the bridges, to be used for passenger vehicles and other high-speed traffic, 6,720,000 lumens of 10,000-lumen sodium lamps will be installed, while 1,500,000 lumens of 6,000-lumen lamps will be used on the lower deck for trucks and lower-speed traffic—a total of 8,220,000 lumens for the project, constituting by far the largest single order ever placed for this type of equipment.

The golden illumination will lend a spectacular touch to the night-time appearance of the bay, will provide comfort and safety for motor-vehicle drivers, and will have the maximum optical efficiency yet attained in any luminaire installation.

Series-type circuits will be used and will be so arranged that adjacent lamps will be connected to different circuits, thus permitting a circuit to be cut out without plunging any one section of the bridge in darkness.

Most of the energy output of the sodium lamps is in the characteristic golden color of sodium, giving the lamps a greater proportion of visible light to other radiated energy than that obtained with other light sources, and thus providing high luminous efficiency and a soft diffused light of essentially a single color—qualities which afford high visibility, freedom from glare, and economy of operation.

Tests indicate that the quality of the sodium light aids definition of small objects at low intensities to a greater extent than any other, including the "white light" or continuous spectrum of the incandescent lamp. Moreover, the 10,000-lumen units to be installed on the bridge will produce about 2½ times as much light as conventional light sources requiring the same energy consumption, while the 6,000-lumen units will produce about 2 times as much.

The fixtures to be used will be of modernistic appearance, and designed to harmonize with the architecture of the project. The posts will be supplied by the Union Metal Manufacturing Co., Canton, Ohio.

Largest Lamps Made

The new type of sodium lamp, which produces 10,000 lumens—the maximum yet available for commercial applications—requires an over-all energy in-put of but 220 watts or less. The sodium lamp itself requires 185 watts or less, and the transformers and other equipment used account for 30 to 35 watts. Incandescent lighting installations require approximately 550 watts to produce 10,000 lumens.

The 10,000-lumen lamp itself consists of a long glass bulb with a special sodium-resistant coating enclosing at each end a coiled oxide-coated filament, which serves as a cathode, and an open-ended sleeve of molybdenum, as an anode. Each lamp, then, has two anodes and two cathodes. The anodes are connected electrically to one side of the filament coil so that only two conductors lead from each assembly. A small quantity of sodium and some neon gas are in the bulb, the neon being used to start operation. The lamp is about 16 inches long from tip to base, and about 3 inches in diameter. A double-walled evacuated flask of about 4 inches in diameter and 16½ inches in length is used with the lamp to retain the heat, which is essential for proper vaporization of the sodium.

To start the lamp, each cathode is supplied with 6.6 amperes exciting current at approximately 2½ volts, for about 20 seconds. After this short preheating interval, the arc potential is applied. Approximately 75 volts are required to strike the arc, after which approximately 33 volts are required to maintain the correct current of 6.6 amperes. The high-peak open-circuit voltage obtained from the series transformer, which exists a very short time before the arc is struck, is used to start the lamp. The cathode-preheating time is obtained by means of a time-delay device incorporated in the luminaire. A film cut-out is shunted across the arc transformer to cut out the lamp in case it does not start properly.

When the lamp is cold, the application of starting voltage strikes an arc in the neon gas within the tube. The lamp then glows brilliantly with the characteristic red color of neon. Sufficient heat is soon stored up to vaporize the sodium, and the lamp gradually acquires the characteristic orange-yellow color of the sodium arc. About 30 min-

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Works: **Newark, Ohio**

utes is required to build up the sodium light to maximum output.

New Type of Reflector

The reflector used with the new type of lighting unit is outstanding not only because of its form, but also because it marks the commercial introduction of a new type of reflecting material.

The lamps have slightly more than 100 square inches of light radiating surface, instead of the theoretical point source of incandescent lamps. This fact necessitates a reflector of decidedly different design.

The lamp is mounted horizontally in a combination of two parabolic and two plane reflectors, arranged to direct the light most effectively along the length of the roadway. The reflectors are of aluminum, treated by a new process which hardens the surface, increases the reflecting power, prevents oxidation, and makes the surface easy to clean. The new material, made possible by the development of the Alzak process, an electrolytic brightening method devised by Dr. R. B. Mason of the research laboratories of the Aluminum Company of America, is an exceptionally bright, durably finished aluminum with a reflection factor of more than 80 per cent. The new process makes it possible to produce bright white, shiny specular surfaces for the sodium-lamp reflectors. The finish is highly resistant to fumes and is not easily stained. Under ordinary conditions practically no permanent deterioration can be detected in the polished surfaces subjected to weathering tests.

New Lights at Saratoga Spa

TO harmonize with the buildings of Saratoga Springs' new $8,500,000 continental-type spa, General Electric's illuminating engineers designed a special cylindrical luminaire and installed 120 of them to illuminate the roadways and buildings of the 140-acre tract. The units are mounted on ornamental steel standards which harmonize with the atmosphere of the spa, and receive their energy from underground, automatically controlled circuits.

The new health center has six buildings—the Hall of Springs, the two Roosevelt Baths, the Simon Baruch Research Institute, the Spa Hotel, and a bottling plant—together with a recreation center with golf course, swimming pool, tennis and handball courts, and bridle and woodland paths, making an attractive and interesting layout.

240 Hp. to Operate a Fountain

MID-SUMMER FESTIVAL FOUNTAIN AT MILWAUKEE

THE recent centennial celebration of the City and County of Milwaukee staged at Juneau Park along the shores of Lake Michigan, included a rather outstanding and unique fountain display. The heart of the fountain is a 150-hp, 2,200-volt centrifugal pump and motor loaned by the Allis-Chalmers Manufacturing Co. as its contribution to the 1935 Mid-Summer Festival. Its capacity of 10 million gallons per day at 28-30 pounds pressure represents 21 per cent of an average pumping day for the entire city, more water than Racine or Madison uses.

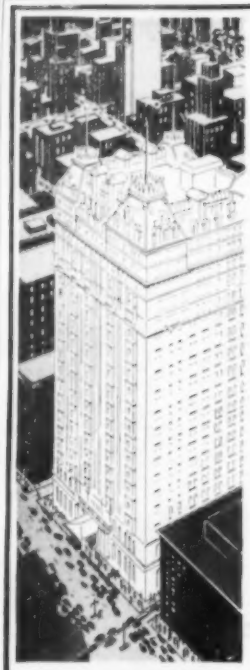
The spray from the fountain shoots into the air to a height of 60 feet over a fan-shaped contour 125 feet wide. Lighting is by 432 incandescent lamps (15 watts) installed under water before vari-colored lenses—amber, white, green, red—with provision for changing and combining the colors. The lights are attached to 12 submerged rafts. There is 90 hp in lighting and 150 hp for the pump motor, a total of 240 hp for the display.

Illuminating Engineering Society Elects Wood President

L. A. S. WOOD, Chief Lighting Engineer, Westinghouse Electric & Manufacturing Company, who was elected President of the Illuminating Engineering Society beginning October 1, was born in London and educated at the University of London. He was connected with the Edison and Swan United Electric Light Co. in the early days of the incandescent lamp, devoted many years to the development of the arc lamp, and took a leading part in laying out street-lighting systems in the larger European cities and also the lighting of many of the public buildings for the British Government.

Mr. Wood came to the United States in 1911 to introduce the flame carbon arc lamp and was shortly afterwards appointed Arc Lamp Expert for the Westinghouse Co., with headquarters at East Pittsburgh. Soon after the introduction of the Mazda C lamp he became associated with the George Cutter Co., of South Bend, Ind., as Illuminating Engineer, and later was made Sales Manager.

At the time the Cutter Company was absorbed by the Westinghouse Electric and Manufacturing Co., Mr. Wood was made Manager of the company's Street-Lighting Department, with headquarters at South Bend. He was located in the Cleveland Works as Manager, Lighting Division, prior to his recent transfer to New York as Chief Lighting Engineer.



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By

RANDOLPH O. HUUS

THIS BOOK discusses realistically and in adequate detail the planning of municipal recreation activities in relation to existing and possible income sources and to expenditure techniques. The limited funds available for urban play and leisure needs make an understanding of budgeting problems and financial planning imperative for all persons interested in increasing the effectiveness of recreational services. Valuable classifications of recreation revenues, expenditures and activities are proposed and a great deal of factual material, never before assembled, is presented. FINANCING MUNICIPAL RECREATION is a distinctive contribution in this field in that it establishes workable relationships between fiscal realities and recreation objectives. Not only park, recreation and planning officials but all individuals interested in the vital problems of recreation should read this book.

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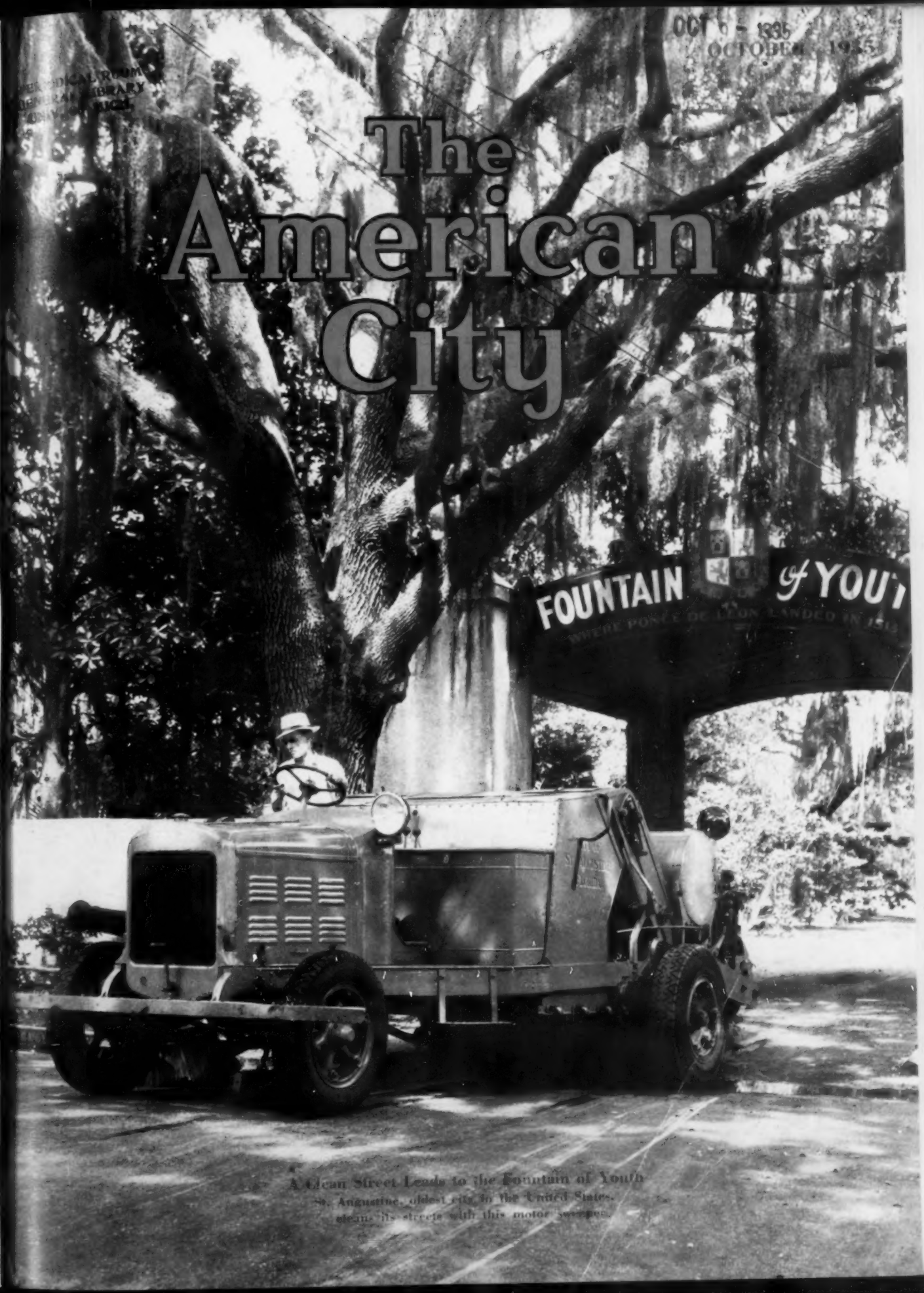

A Model Street Leads to the Fountain of Youth

St. Augustine, oldest city in the United States, cleans its streets with this motor sweeper